Vol. VIII. - No. 3

January, 1932

MOTOR SPORT

LAND AIR WATER

Incorporating the
BROOKLANDS GAZETTE

6D

Monthly

A great exponent of the pastime—Earl Howe.

FOR SPEED WITH SAFETY fit
FERODO
REGD. TRADE MARK
BRAKE LININGS
FERODO LIMITED · CHAPEL-EN-LE-FRITH
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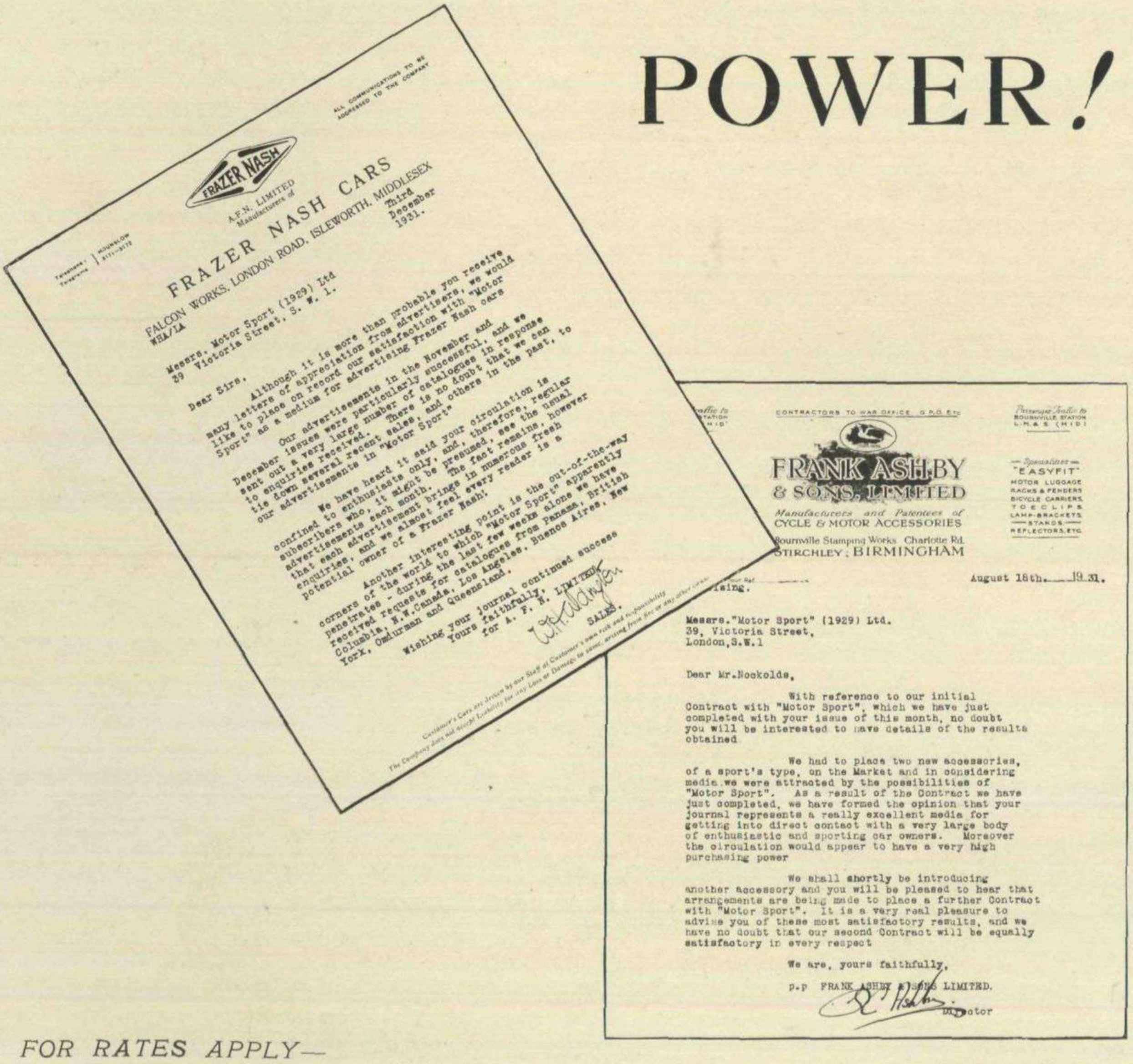
PULLING POWER!



ALL COMMUNICATIONS TO BE ADDRESSED TO THE COMPANY

Telephone:
Telegrams: HOUNSLOW

A.F.N. LIMITED
Manufacturers of
FRAZER NASH CARS
FALCON WORKS, LONDON ROAD, ISLEWORTH, MIDDLESEX

WHA/LA

Third
December
1931.

Messrs. Motor Sport (1929) Ltd
39 Victoria Street, S. W. 1.

Dear Sirs,

Although it is more than probable you receive many letters of appreciation from advertisers, we would like to place on record our satisfaction with "Motor Sport" as a medium for advertising Frazer Nash cars.

Our advertisements in the November and December issues were particularly successful, and we sent out a very large number of catalogues in response to enquiries received. There is no doubt that we can tie down several recent sales, and others in the past, to our advertisements in "Motor Sport".

We have heard it said your circulation is confined to enthusiasts only, and, therefore, regular subscribers who, it might be presumed, see the usual advertisements each month. The fact remains, however that each advertisement brings in numerous fresh enquiries, and we almost feel every reader is a potential owner of a Frazer Nash!

Another interesting point is the out-of-the-way corners of the world to which "Motor Sport" apparently penetrates - during the last few weeks alone we have received requests for catalogues from Panama, British Columbia, N.W.Canada, Los Angeles, Buenos Aires, New York, Omdurman and Queensland.

Wishing your journal continued success

Yours faithfully,
for A. F. N. LIMITED.
SALES.

Customer's Cars are driven by our Staff at Customer's own risk and responsibility. The Company does not accept Liability for any Loss or Damage to same, arising from fire or any other cause.

CONTRACTORS TO WAR OFFICE, G.P.O. Etc.

Passenger Traffic to
BOURNVILLE STATION
L.M.&S. (MID)

FRANK ASHBY
& SONS, LIMITED
Manufacturers and Patentees of
CYCLE & MOTOR ACCESSORIES
Bournville Stamping Works, Charlotte Rd.
STIRCHLEY, BIRMINGHAM

— Specialities —
"EASYFIT"
MOTOR LUGGAGE
RACKS & FENDERS
BICYCLE CARRIERS
TOE CLIPS
LAMP-BRACKETS
— STANDS —
REFLECTORS, ETC.

August 18th. 19 31.

Messrs."Motor Sport" (1929) Ltd.
39, Victoria Street,
London,S.W.1

Dear Mr.Nockolds,

With reference to our initial Contract with "Motor Sport", which we have just completed with your issue of this month, no doubt you will be interested to have details of the results obtained

We had to place two new accessories, of a sport's type, on the Market and in considering media we were attracted by the possibilities of "Motor Sport". As a result of the Contract we have just completed, we have formed the opinion that your journal represents a really excellent media for getting into direct contact with a very large body of enthusiastic and sporting car owners. Moreover the circulation would appear to have a very high purchasing power

We shall shortly be introducing another accessory and you will be pleased to hear that arrangements are being made to place a further Contract with "Motor Sport". It is a very real pleasure to advise you of these most satisfactory results, and we have no doubt that our second Contract will be equally satisfactory in every respect

We are, yours faithfully,

p.p FRANK ASHBY & SONS LIMITED.

Director

FOR RATES APPLY—

ADVERTISEMENT MANAGER,
MOTOR SPORT (1929) LTD.,
39, VICTORIA STREET,
LONDON, S.W.1.

BODY REPAIRS
ENGINE OVERHAULS
ENGINE TUNING
SPECIAL EXHAUSTS
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CYCLE WINGS
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Specialists in—
FRONT WHEEL DRIVE ALVIS
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BENTLEY 3-LITRE
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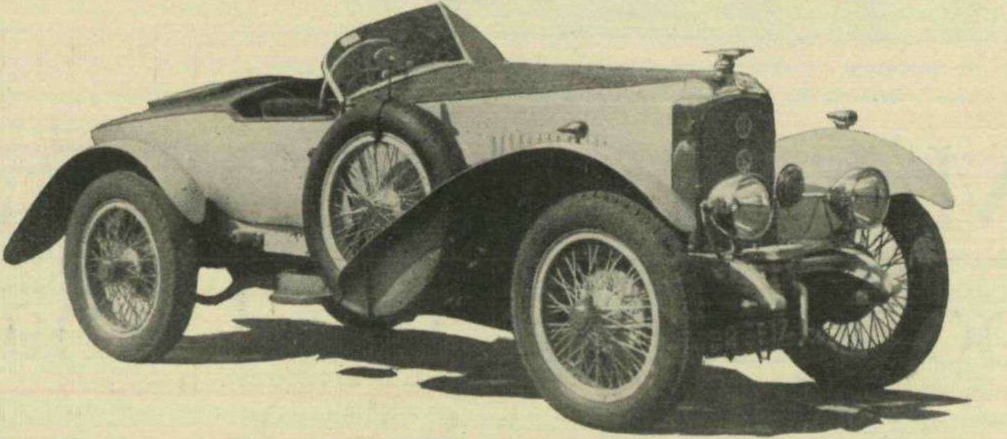
K. C. BODIES, 405/11 NEW KINGS ROAD, FULHAM
PHONE: PUTNEY 0848

30-98 VAUXHALL'S



We always carry a large stock of these famous Sports Cars from £60 upwards, and have Spare Parts for both S.V. and O.V.H. models.

We can Estimate for **Complete Engine and Chassis Overhauls, Special Tuning of Every Description, Paintwork and Body Building.**

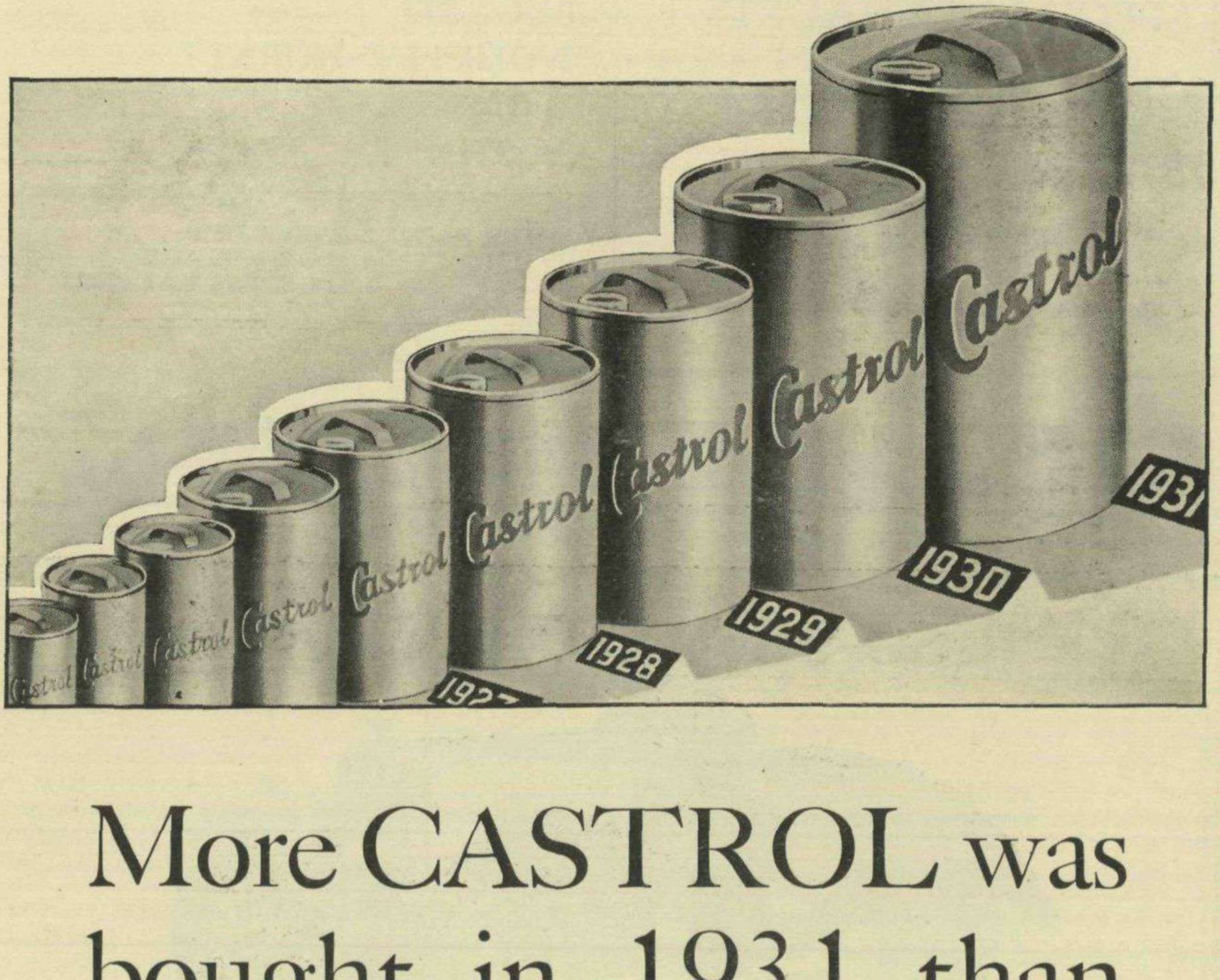
Crackington Motors, Welwyn, Herts

Works :—
35a, HERTINGFORDBURY ROAD, HERTFORD.

Telephone :—
WELWYN 154

BY APPOINTMENT TO HIS MAJESTY THE KING

FOR 10 CONSECUTIVE YEARS EVERY YEAR HAS BEEN A RECORD CASTROL SALES YEAR



More CASTROL was bought in 1931 than ever before.

A clear proof that "Quality is the Best Policy"

Have you tried CASTROLLO*—the Upper Cylinder Lubricant ? It reduces friction, wear and petrol consumption and is particularly valuable when starting off these cold mornings. A pennyworth is sufficient to treat 2 gallons of fuel.*

C. C. WAKEFIELD & CO. LTD., *All-British* Firm, Wakefield House, Cheapside, London, E.C.2

VOL. VIII. No. 3.
SUBSCRIPTION RATE
8/- PER ANN. POST PAID

JANUARY 1ST, 1932.

PRICE SIXPENCE
Published 1st Month

MOTOR SPORT

INCORPORATING THE BROOKLANDS GAZETTE

JOINT EDITORS } *GRENVILLE G. O. MANTON.*
W. S. BRAIDWOOD, B.A. (Mech. Sc.) Cantab.

Editorial, Publishing & Advertising Offices
39, VICTORIA STREET, LONDON, S.W.1
Telephone: Victoria 5218.

The Way of Things

ELSEWHERE in this issue, under the heading of "The Vicious Circle," a contributor draws attention to the position which has arisen in the racing world, in which the attempt to depart from the special racing car has led us through a series of changes in the sports car racing rules, until we are back again in effect to the point where we started.

Most of these points must have already occurred to racing men, but what the end will be is not so obvious. MOTOR SPORT has always contended that the racing car, as far as possible unrestricted, is the best medium for development, and the truth of this is being borne out by the steady tendency of the sports car race to merge once more in the pure racing car event.

It would be absurd to contend that the interlude in racing in this country has failed to benefit cars, as the necessity of basing the racing machines on standard models has made much better cars available to the public.

Further progress must now be in the direction of proving that British cars can race successfully, not only in their own country, but against continental makes on their own ground.

Occasional individual entries are a sporting gesture, but something more serious than this is required. What is really wanted is a team entry from an experienced firm, and many motorists will hope that the M.G. Car Company will follow up its amazingly successful 1931 season with an enlarged programme for the year that is now opening. Any firm which undertakes a scheme of this sort for the coming season will have the heartiest good wishes from every motorist in this country. The gradual re-entry of British makes into the lists of Continental races will be the greatest factor in ensuring a satisfactory evolution of our own racing regulations.

It is perfectly obvious that English designers can, when required, make a real racing car which is in no way inferior to foreign marques, and given sufficient practice, our best drivers are quite capable of giving a good account of themselves in any class of event. We have, in short, all the material and personnel necessary to stage a real onslaught on international racing. And to those who can make this possible—our manufacturers—we say, "Get down to it."

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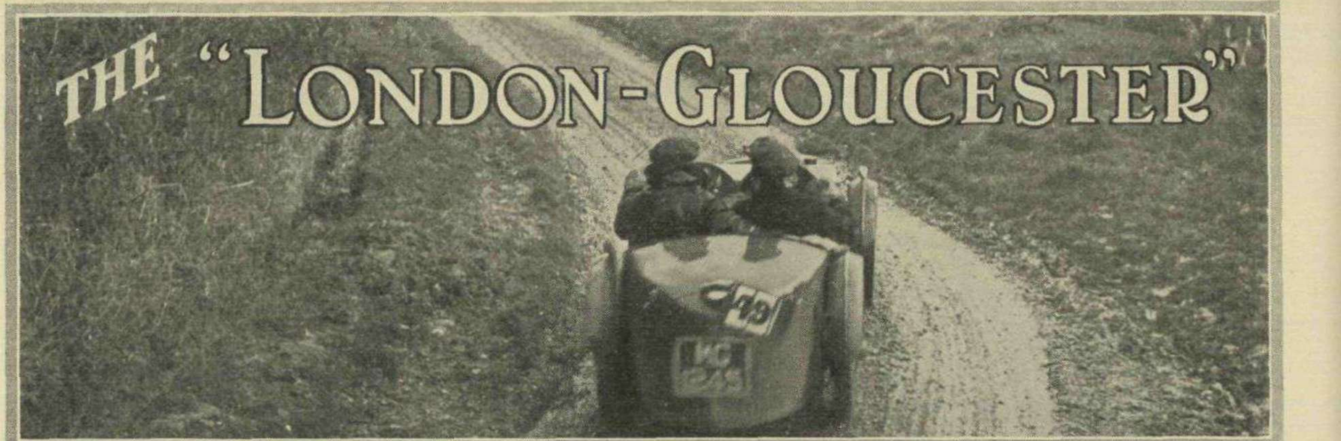
THE "LONDON-GLOUCESTER"



THE NORTH-WEST LONDON CLUB'S WINTER CLASSIC.

THE twenty-first trial of this series, which took place on the 12th of last month, was chiefly of interest in showing that, although cars have improved in the last few years, the standard of driving has not been raised.

In fact, a large proportion of the entry showed a lack of knowledge of the requirements of trials work which was surprising. It is said that we live and learn, but in some cases it is evident that the second part of this dictum is considered superfluous, and the experience of others in the past has been of no benefit to such as these.

The excellent performances of the comparatively few who have taken advantage of the more suitable cars made to-day, and have set themselves to get the very best out of them, showed up the incompetence of some of their fellow competitors in a most painful manner, and it is the violent contrast in the performances which seems to make the present-day trial so different from its predecessors.

The London-Gloucester trial has for some time since ceased to have any marked connection with either city, and the first man left Staines just after midnight and occupied the small hours of the morning in getting to Cheltenham, where a welcome breakfast was served at the Cadena Café.

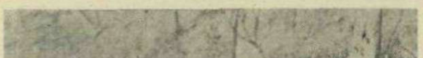
The only observed hill on the outward run was Maidens Grove near Henley, which caused practically no trouble to anyone, being dry.

The 116 competitors, of whom all but 30 were driving cars, had little to complain of in the way of weather, which remained fine and dry for the whole event, and they had nothing to bother about till the serious work of the trial commenced after breakfast.

The route then led to the first batch of observed hills, commencing with Stancombe, which is the sort of country lane which anyone might be expected to include in a day's work without more than a comment that it did not leave much room, and this is how it was treated by the majority of the entry. One or two failures occurred, but these merely demonstrated that if enough motor-cars are gathered together one or more will have minor trouble of some sort. The 1100-1500 class, consisting mainly of the Wolseley Hornets, M.G. Magnas and Frazer-Nashes, was the most convincing.

The next hill, Bismore, proved unexpectedly troublesome. It had been earmarked for a 50 yards acceleration test, the distance having to be covered in 18 secs., but the re-start proved too much for the small cars, and considerable delay ensued.

Many clutches suffered severely as a result of being used as an " extra gear," and Fairtlough (Salmson) was among those whose efforts to overcome the too high bottom gear of their cars permanently weakened their motors for the rest of the trial.



[Motor Sport Photo

There was a lot of this on Bushcombe. The unfortunate here seen is F. M. Shepherd (Austin).

The early cars having shown that the job was beyond them the test was washed out, though some cars, notably some M.G. Midgets, completed the test with flying colours.

The next three hills produced little incident and a cross-country route led to the check at the White Swan, where supplies for man and machine were available. There was considerable comment when it was learnt that Bushcombe had just been resurfaced, and many seemed to think that its inclusion would therefore be quite pointless.

This trial was one of unexpected difficulties, however, and those who scoffed at Bushcombe spoke too soon. A stop and re-start test was staged here, in which competitors were required to pass the second line, 20 yards distant, 8 secs. or less after leaving the first.

This seemed easy enough, especially after some of the motorcycles had treated it like a speed event, but when the cars appeared, a general attack of exhaustion seemed to overcome many of the engines, and the tow-rope ceased to be ornamental, and gave plenty of chance for the tow gang to keep warm.

The Morgans were good and had ample power, those driven by R. T. Horton and G. C. Harris being particularly quick off the mark, having twin rear wheels to assist their grip.

H. S. Linfield on a " blown " Montlhéry Midget was fast, and the larger cars climbed well on the whole. It was in the small class that the lack of " horses " was most apparent. Marshall's Austin with a very lightened body had to be towed up, as did, among others, F. M. Shepherd and W. G. Rushworth also on Austins.

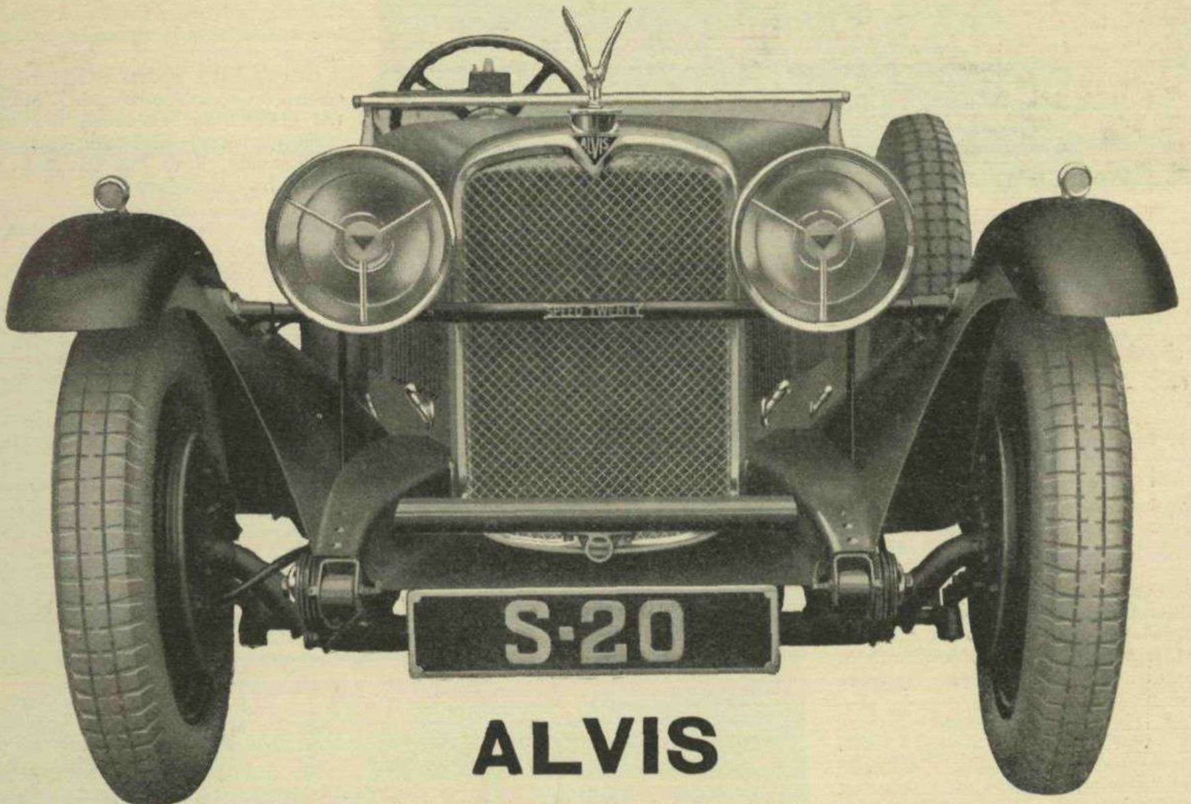
Outstandingly good performances were made by Hollinghurst and Foster on M.G. Magnas, and Olive on his Standard Avon, while Hunter and Vaughan on Rileys, and Bryden on a B.S.A. 3-wheeler, and the Wolseley Hornets, were also good.

A further spell of cross-country work brought the drivers to Iles Lane, the first hill of the last batch of hills, and one which was destined to cause a lot of trouble. At the start the surface was quite firm, and

Charles Follett Ltd.

announce an

ENTIRELY NEW SPORTS CAR



ALVIS

SPEED-TWENTY

CHASSIS PRICE £600. COMPLETE FOUR SEATER TOURING CAR FROM £695.

Abridged specification :—

Engine. 19.82 h.p. Six cylinders, monobloc casting, 73.0 mm. bore by 100 mm. stroke,—2,511 c.c capacity. Detachable head.

Cooling. Pump circulation is used in conjunction with an exceptionally large and efficient radiator.

Radiator. Genuine honeycomb radiator with chromium plated case and with very smart chromium plated stone guard.

Carburettor. Three specially balanced S.U. Carburettors.

Clutch. Single plate clutch of exclusive ALVIS design, providing remarkable ease of control and easy gear change.

Gear Box. Four speeds forward and reverse, central change by short stiff lever, silent third gear. Gear box ratios: 1-1, 1.38-1, 2.12-1, 3.45-1. Reverse 3.45-1.

Rear Axle. Full floating rear axle of ALVIS design and manufacture. Axle ratio: 4.5-1 or 4.7-1.

Four Wheel Brakes. Special ALVIS brakes (Patent No. 356,596) in drums 14 ins. in diameter, ribbed for cooling. All four brakes are operated by foot pedal and by hand lever.

Front Axle. Is designed to take the stresses imposed by front wheel brakes, and is a solid drop forging of high tensile steel.

Steering. Of new pattern, designed for easy but definite steering with low pressure tyres.

Springs. Semi-elliptic front and rear, of special alloy steel, and of exceptional length. Rear springs are underslung. All springs enclosed in grease filled leather gaiters.

Chassis Lubrication. One shot system operated from tank, on dashboard.

18, Berkeley Street
W.1.

MAYFAIR 6266

THE "LONDON-GLOUCESTER"—continued.

Not a rugger scrum!—merely Iles Lane before the horses arrived.

in spite of the two bends and the 1 in 4 gradient the early arrivals got up without trouble.

The surface very soon began to suffer, however, and before long it had become a really worthy obstacle, which was not, however, bad enough to stop a suitable car properly handled.

A slimy hill with sharp corners and a roughish surface is always a good test of skill, and in this trial proved the lack of it in many competitors. The chief cause of failure was wheelspin, although lack of power accounted for a few, but in each case bolder tactics in the way of speed on the lower slopes would have done much to help, while the former trouble would in many cases have been overcome by more attention to tyre pressures.

C. W. B. Marshall atoned for his failure on Bushcombe by making a good climb, while Taylor and Mere (M.G. Midgets) made fast ascents. Fairtlough's Salmson was still suffering from attempts on Bismore, and petered out.

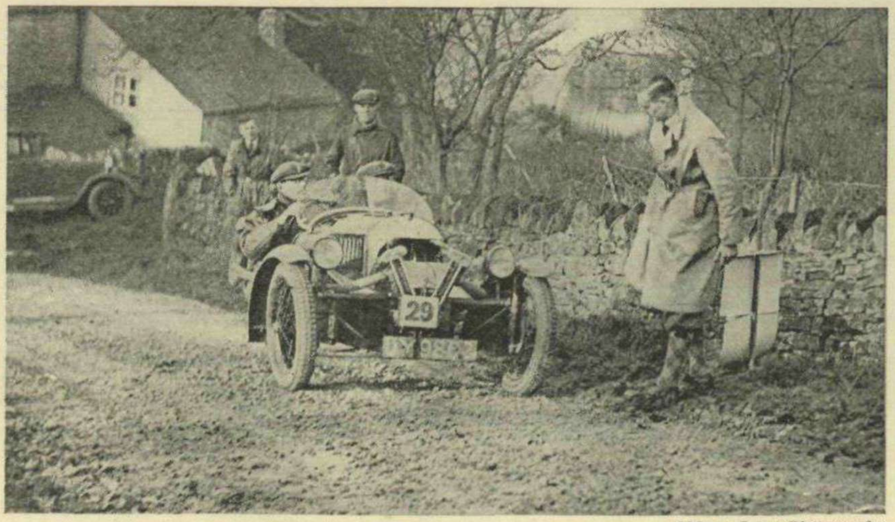
A general view of the restart on Bushcombe; the driver is C. F. Widmann (Triumph).

The hill was rapidly becoming worse and the volunteers assisting the cars to the summit were having a hard task when relief arrived in the shape of a pair of first-class horses, which proceeded to deal with the failures in a most effective manner. The Riley contingent mainly failed with wheelspin, honourable exceptions being Hunter and Lawford.

The Wolseley Hornets made an excellent showing, all being good and steady, with the two McEvoy Specials probably the fastest of all.

Olive's little sports Standard was excellent, as was Foster's M.G. Magna, but the failures far exceeded the successes.

King's very old Frazer-Nash made a good steady climb, but this make was not up to its usual form.



[Motor Sport Photographs.

R. T. Horton (Morgan) getting away well on Bushcombe.

J. Windle (Frazer-Nash) failed with wheelspin after approaching too slowly and then proceeded to run back and make several more unsuccessful attempts. He seemed to resent the suggestion that his board-hard tyres would serve him better with less air in them, and he was eventually removed by the horses so that the event could proceed.

The long list of failures is not worth recording, the only bright spots in the later part of the entry, being C. Mann's Ford, and R. J. Morley's A.C.

Nothing important occurred before the final hill, Ferris Court, on which a timed section was in operation. This hill itself was dry and in excellent condition though the main hairpin was rather loose.

The only failures were those who neglected to treat this corner with sufficient respect, and hit the outer bank in consequence. These included the Frazer-Nashes driven by Windle and Vickers, and Raymond Way's speed model Rover.

The finish was at Birdlip, and although the delay was considerable, this was no fault of the organisers, as none of the hills could be placed in the freak category, and were perfectly fair.

THE R.A.C. RALLY.

1,000-MILES EVENT FOR NEXT MARCH.

THE rally type of event has long been popular on the Continent, and it certainly provides a welcome and refreshing change from the more normal reliability trial, in that considerable choice of route is open to the competitors.

The event which is to be organised by the R.A.C. and will be run at the beginning of March next, is to be over a distance of 1,000 miles. The finishing point will be at Torquay, and the routes may be selected from the choice published by the R.A.C. from whom all particulars can be obtained.

The starting points from which choice may be made are the following :—London, Bath, Leamington, Buxton, Harrogate, Norwich, Liverpool, Newcastle-on-Tyne, and Edinburgh.

The trial will be divided into two classes—up to 1,100 c.c. and over that size, similar to the Monte Carlo event.

The trial will be run throughout at an average speed of 25 m.p.h. for the large class and 22 m.p.h. for the small cars, this average to include all stops.

At the finish the cars will undergo an inspection for detail faults, and will then take part in a flexibility and brake test. For the first 100 yards of this the driver will go as slowly as possible in top gear, and then turn within a radius of 30ft. and proceed to accelerate in a gear or gears he likes over a further 100 yds., at which point he must apply his brakes and stop in the shortest possible distance.

His figure of merit is then obtained by means of a formula.

The event should prove very attractive to those who cannot afford the time or expense of one of the Continental rallies, and it should also be good propaganda on behalf of motoring, which in spite of its development, still has much prejudice with which to contend.

British Empire Trophy.

IT is a great pity that the running of the Phoenix Park races in previous years has failed to provide a financial success, and that the event will not be held again this year. However, Mr. Edwards, the enterprising Secretary of the B.R.D.C. has arranged another event for 1932, which will take place on April 30th, and called the British Empire Trophy.

His idea is to hold a race on the lines of the Monza affair, when a day's racing will include heats and then a final, all being scratch races for real racing cars.

The Monza race is over about 150 miles, but these will be shorter, 50 miles each being suggested with a 100-mile final, so that the whole affair can be fitted into an afternoon. There are to be class races for 1,100 c.c., 2-litre, and unlimited, followed by the final for the first 3 or 4 in the first events. It is hoped that a foreign entry will be forthcoming, and the whole event should be one of the best ever staged at the track. The most joyful aspect of the affair is the return to scratch races, when the winner definitely wins, and there are no arguments.

Three Coventry Firms Combine.

OF recent years Riley cars have been the product of three separate organisations. The Riley Engine Co. built the 9 h.p. unit, whilst the Midland Motor Body Co. supplied the major portion of the coachwork. Both of these concerns have now been taken over by Riley (Coventry) Ltd.

In announcing this arrangement, Mr. Victor Riley said that it would bring about considerable economies in working.

It is interesting to learn that the 9 h.p. car had been exhaustively tested by the Army authorities and that it is now widely used in the British Army both at home and overseas.

A Very Gallant Action.

A SERIOUS accident was narrowly averted recently near Bristol, where a horse drawing a delivery van, on being frightened by a steam waggon, shied and galloped driverless through the main street of a village.

Children playing in the vicinity had an alarming experience, and would undoubtedly have been injured, but for the prompt and plucky action of an Automobile Association patrol, who dashed to the rescue, seized the reins, and succeeded after a terrific struggle in bringing the animal to a standstill.

Eventually the A.A. patrol, although injured, quietened the horse, and kept it under control until the arrival of the owner.

Winter Lubrication.

THE lubrication system of every car on the market has its own special characteristics. On many makes of car, for example, it is possible and is definitely advisable to change during the winter months to a lighter grade of oil.

But before such a change is made owners should consult the instructions issued by the manufacturers, or by the oil companies.

In the choice of a suitable grade of oil many factors have to be taken into consideration.

First and foremost there is the type of lubrication system employed. Another important factor is the speed and the temperature at which the engine works. Again, there is the quantity of oil in circulation and the system—if any—by which it is cooled.

Thus it is that two makes of car with roughly the same performance, and of the same horse power, will require different treatment in the winter. On the one it is perfectly safe to change over to a lighter grade of oil during the cold weather. The other, however, should be run on the same grade of oil throughout the year.

Take the case of two well-known "Nines." On one, Castrol XL. is recommended both for winter and summer use. On the other, owners are advised to change over to Castrol AA., a lighter grade of oil, during the winter.

Again, for old models of one very well-known make of car, the Wakefield Company recommend, even for summer motoring, Castrol F, the lightest of their standard grades. But for later models they recommend different grades for winter and summer use, both of them heavier than Castrol F.

The requirement of every individual make, and in many cases of individual models, have to be taken into consideration before the manufacturers or the oil companies concerned can recommend this or that grade of oil.

Few ordinary motorists have sufficient technical knowledge to decide for themselves what grade of oil they should use. It is a matter for experts, and they should strictly follow the considered advice which the expert gives.

Earl Howe—A Correction.

IN a list of racing results of the 1931 season, which was published in our last issue, an error crept in in regard to the placings in the Dieppe Grand Prix. Third position in this event was secured by Earl Howe on a 1½-litre Delage, and not by de Maleplane (Maserati) as was stated. The latter was fourth.

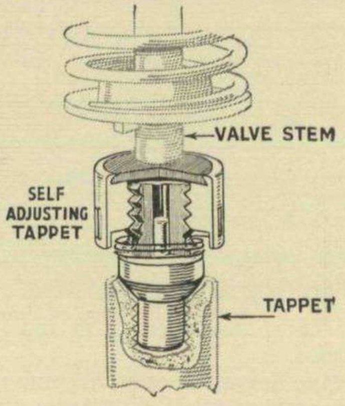
AUTOMATIC TAPPET-ADJUSTMENT

A NEW INGENIOUS ENGINE ACCESSORY.

TO the motorist who takes any interest in his engine, the question of tappet clearance is one of the most important, and many hours are spent in adjusting and readjusting them. With modern engines, the actual rate of wear is very slow, and the idea of a self-adjusting tappet is not primarily useful in combating this. The much more important factor is the allowance for expansion due to temperature without making it necessary to set a comparatively large gap when cold.

The new tappet, which is made by Self-adjusting Tappets Limited, 198, Piccadilly, London, W.1., is suitable for side-valve engines with normal clearances up to 8/1000ths of an inch.

The device consists of a hardened head, free to rotate on a coarse-threaded stem, and held up to the valve stem by a light spring similar to the hair-spring of a watch.



A sketch which shows the components of the new tappet here described.

In practice the tappets are held just in contact without actually lifting the valve, and when the valve stem expands with heat it automatically adjusts itself to maintain clearance.

The makers have successfully tested the device for long mileages, and it should find a ready market.

We hope to be able shortly to publish the results of a test on one of our own cars.

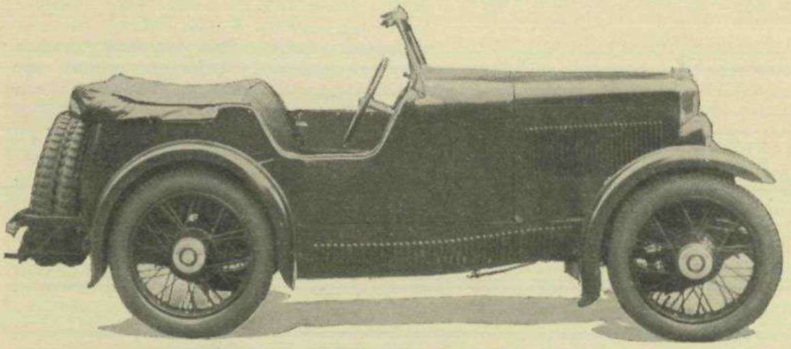
MORE M.G. MONTLHÉRY RECORDS.

AS a fitting conclusion to a year of consistent record-smashing, Mr. George Eyston successfully attacked four records at Montlhery track on the 22nd December last with his wonderful 750 c.c. M.G. Midget.

The records which fell to him were the 5 kilometres, the 10 kilometres, the 5 miles and the 10 miles, and the speeds recorded respectively were :—114.77 m.p.h., 114.72 m.p.h., 114.74 m.p.h., and 114.46 m.p.h.

The car which accomplished this truly astounding performance was the one which caught fire during a previous attempt, when Eyston was severely burned in consequence. Apparently this mishap has left both Midget and driver quite unaffected.

ANNOUNCING THE McEVOY "SPECIAL" MORRIS MINOR



The "Le Mans" 2/4 Seater.

MODEL "60"
Standard Engine, Polished Head £149

MODEL "70"
Tuned Engine, Polished Head, Downdraft Carburetter, Streamline Exhaust Manifold £160

CALL FOR DEMONSTRATION OR ENQUIRE FROM YOUR LOCAL MORRIS DEALER.

M. A. McEVOY (London) Ltd., 146, High Street, Notting Hill Gate, W.11.
'Phone : Park 5438.

SPECIALISTS IN COMPLETE OVERHAULS AND HIGH EFFICIENCY TUNING OF ALL SPORTS CARS, ESPECIALLY HORNETS, MIDGETS AND MINORS.

MOTORING SPORTSMEN

(*NEW SERIES*).

I.—EARL HOWE.

IT is a matter of great satisfaction to begin this series by an interview with Lord Howe, for apart from his position as President of the B.R.D.C., and the successes which he has achieved on road and track, the sporting motorist of Great Britain owes him a great debt of gratitude for the work he has done in attempting to overcome the prejudice with which the "official person" regards the owner of a sports car, and for his efforts to reduce the difficulties of holding a road-race in England.

Lord Howe has always had an affection for fast motors, and before the War covered large mileages at home and on the Continent on Rolls-Royce, Napier and Sunbeam cars, to name a few. Experience gained in this way is of immense value, for the emergencies of racing require an immediate and instinctive reaction if disaster is to be avoided. The outbreak of War brought these pleasant excursions to an end, and 1914 saw him in France again on a different mission, for he was mobilised on the outbreak of hostilities, and proceeded at once overseas with the Naval Division. After service there he spent the remainder of the War period at sea.

After the War he returned to his favourite hobby of motoring, and began to take an interest in the competitive side of the pastime. To accustom himself to the atmosphere of the sport, he took part in various small events, mostly on Bugattis, his first big race being the Essex "Six Hours" in 1928.

This race gave promise of being interesting, for an Alfa-Romeo team, Campbell and Viscount Curzon, as he was then, on Bugattis, an Austro-Daimler, and a Mercédès combined to give the event quite an international flavour. The Mercédès after a late start put in a meteoric lap after which it gave up, and Viscount Curzon took the lead. Unfortunately ignition trouble set in and he gradually dropped back, and was forced to retire in the 16th lap.

He also took part in the R.A.C. Tourist Trophy, which was revived that year. He and Campbell had entered Bugattis, and after some trouble with faulty petrol tanks, special ones were made. Unfortunately, these proved to be unsatisfactory also, so that on the eve of the race they had to put back the old ones, with the result that had been feared. After two laps Campbell came in with sheets of flame pouring from the back of his car, and Lord Curzon was later forced to retire from the same cause. In the 1929 T.T. he again drove a Bugatti and completed the course without trouble.

In the following year Lord Howe enlarged his racing programme, and driving the Mercédès with which Caracciola had won the Tourist Trophy of the previous year, came third at Dublin, while his piloting of a six-cylinder Alfa-Romeo with Campbell at Le Mans brought him a fifth place. This entitled him to compete in the final of the Rudge-Whitworth Cup in 1931. He also entered the Mercédès at Ards, and finished after a most unpleasant run in the rain.

During the past season he really came into his own, and achieved the success which his keenness and persistence deserved. His first race of the year was the Monaco Grand Prix, and though he did not finish, the experience was one to be remembered. The race is unique in that all the drivers are picked men, and only enter by invitation. The competitors all know to an inch the capabilities of their cars, which makes the event a little safer than it looks, but passing is "a great adventure" to quote Lord Howe, for there is only just room in many of the streets, and if the following driver is not very agile in overtaking, he finds himself on top of a corner, and has to brake skilfully to avoid disaster. The constant changing up and down in an atmosphere of petrol and oil fumes makes strong men wilt, and wonder why they ever entered for those seventy laps of purgatory. Lord Howe trained rather thoroughly for it, and finished up by a course of driving on the Bugatti practice track at Molsheim in Chiron's wake, but in the race his car was put out of action after a few laps by a stud coming out of an oil pipe, which caused one of the camshafts to seize.

Brooklands Achievements.

Returning to England, Lord Howe next appeared at the Whitsun Meeting at Brooklands, driving the 1½-litre Grand Prix Delage which used to belong to Sir Malcolm Campbell. Car and driver surpassed themselves, for the car won the Gold Star and the Long Handicap races, the first at a speed of 120.8 m.p.h., with a lap at 126.4, 5 m.p.h. better than its previous best and the fastest 1,500 c.c. lap ever done on the track.

Turning then to road-racing, the Mercédès was once more brought out, and at Dublin, Lord Howe put up the fastest lap with it, and finished fifth. He might well have secured a higher position had not a stone broken the supercharger casing. Crossing then to Le Mans he drove an eight cylinder Alfa-Romeo with Sir Henry Birkin to win the Grand Prix d'Endurance. This was a fine performance, for the English

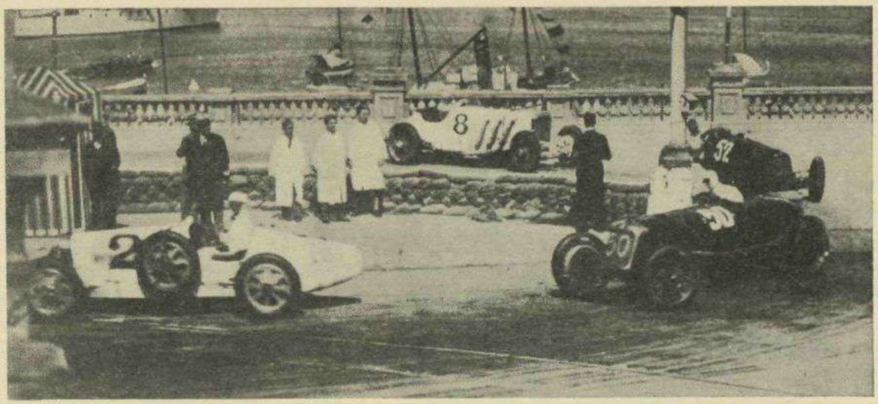
MOTORING SPORTSMEN—continued.

drivers had against them the official entries of the Bugatti and Alfa-Romeo factories, not to mention the Mercédès and other opponents who were ready to slip into their place at any sign of weakness. They advanced steadily through the field to win at a record speed.

Later, Lord Howe took the "Merc" down to Shelsley and annexed a brace of cups, and then when back again in France, with the five year old Delage at Dieppe, he won the 1,500 class and came third in the open classification, only three kilometres behind the second man, Czaikowski, on a Bugatti. Intentional damage on the part of some "sportsman" to one of his tyres cost him three laps, otherwise he might have brought off the double event.

The Ulster race is still fresh in everyone's memory, in which Sir Henry Birkin and Lord Howe on their Alfas strove valiantly to keep ahead of the Italian drivers. A skid when descending Bradshaw's Brae involved Lord Howe in an extraordinary accident, for his car charged the hedge and dropped several feet into the field below, almost decapitating some spectators who had been standing there. Fortunately, driver and mechanic both escaped unhurt, but the brake mechanism was damaged, and the car had to be withdrawn.

Great things were expected of the double-camshaft Bugatti in the 500 Miles Race, but the breakage of a valve, a most unusual thing on these cars, put it out of action before it really got going.


"Passing in the Monaco Grand Prix is a great adventure" says Lord Howe. Here is a scene in this event.

To this catalogue of events we must add finishes in the French and the German Grands Prix, completing a racing season as varied as anyone in England could hope to experience.

All Lord Howe's racing cars are of foreign make, not from a desire to add variety to British racing, as has been stated sometimes, but because he considers they are the only cars suitable for the work. In sports car races he drives either a straight eight Alfa-Romeo or the famous Mercédès on which Caracciola won the Ulster T.T. in 1929. The Mercédès is seen at its best in comparitively straightforward circuits such as the Dublin Grand Prix, but it is a delightful car to handle, and cannot be too unwieldy, for it was very successful at Shelsley Walsh this year when much smaller cars found the road not nearly wide enough.

For racing, Bugatti cars have long been his choice, but he also had one of the 1925 G.P. Delages. Last year he acquired a second one which had formerly belonged to Sir Malcolm Campbell, and which went at unprecedented speeds at the Whitsun Meeting. Here again the circuit dictates which car is to be run, so that for tortuous courses like the Monaco Grand Prix, the Bugatti is more suitable, while the Delage is given more scope by a normal road-race circuit.

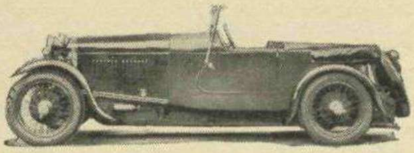
The tuning and preparation of Lord Howe's racers is carried out by his own staff of highly-qualified mechanics, and in our interview he emphasised the vital importance of their work, and the keenness and efficiency with which it is carried out—a fact which is too often passed by in the glamour of success of the car and driver. Incidentally, all his men are English, although on various occasions during his Continental racing, his cars have been tended by French and German mechanics. But, as Lord Howe pointed out, in such circumstances complications are liable to ensue when one does not always understand exactly what is being said!

Knowing that Lord Howe's attention has in the past few seasons turned more and more to racing on the Continent, we broached the subject with him as to the reasons which prevent British makes from figuring conspicuously in these events.

"The first thing," he said, "is that except at le Mans, there is no

[*Motor Sport Photograph.*

A Shelsley memory. Lord Howe roaring up the famous hill in his big "Merc," during last year's event.



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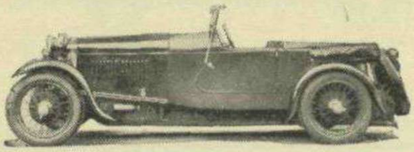

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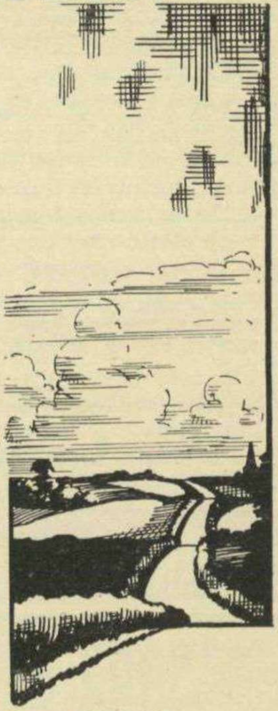

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MOTORING SPORTSMEN—continued.

system of handicapping which gives the smaller cars a fair chance, consequently, to achieve success they must be phenomenally good. Nobody can deny that the 750 c.c. cars of this country have a wonderfully high degree of efficiency, but it is too much to expect these little fellows to compete with the Bugatti and the Alta on equal terms."

1932 Chances.

The Riley, he thought, was on a better footing, and did very well to win its class in the German Grand Prix, and on its form near the end of the last season it could be expected to do even better this year.

All our larger cars, he continued, come into the sports car category, and with the exception of the Talbot, are not raced seriously. The utilisation of blowers on these motors, he thought, might boost them up sufficiently to make them comparable in performance with the Continental 100 per cent. racing thoroughbreds, and it will be interesting to see if the manufacturers will do this in the near future. Lord Howe considers that the majority of English manufacturers are most apathetic in the business of real racing, and he deplores the fact that the amateur gets no real support from the factory, without which he cannot hope to prevail against the perfectly organised foreign camps.

Another obvious factor which retards the development of the sports car in this country is the dearth of races, and especially of racing-car events. On the Continent, if a manufacturer thinks of a good idea, he can embody it in a racing car and try it out in one of the races which occur practically every week-end all over Europe. In Great Britain such things are unknown, so that any new feature has either to be tried out at Brooklands, which cannot provide the violent stressing which takes place in fast driving on a natural course, or it appears in a team of sports cars, of which a certain minimum number have to be made before the new type may be raced.

"This procedure," Earl Howe said, "is a perfect example of 'putting the cart before the horse,' for one always regards the sports car as a more-or-less finished product, of which the racing machine is the experimental type. Consequently, if a racing car blows up, nobody, except possibly the designer, worries very much, while if a new series of sports cars appears and experiences trouble, this may have a nasty reaction on the firm's sales. Apart from that, the production of the minimum number of sports cars may inflict a considerable financial burden on the smaller firms. Our manufacturers are thus heavily handicapped, and their originality is stifled for want of scope."

English drivers, he considers, as opposed to English cars, have shown themselves capable of competing on equal terms with those on the Continent, but it must not be forgotten, that without abundant practise they could not hope to compete with foreigners who are taking part in racing continuously throughout the season.

The moral of all this seems to be, "More (or rather some) races for England." To have these it would be necessary to close public roads, which requires an Act of Parliament, and on this procedure Lord Howe can speak with authority, for in conjunction with Colonel Moore-Brabazon he has made several attempts to get a Bill passed. The heavy pressure of public business makes it unlikely that the party in power would ever sponsor such a measure, so that it must be left to the efforts of private members. When once introduced the next stage is to get "Permission to Print," but if even one Member makes a protest, the Bill has to be dropped. Knowing the prejudice that exists against racing in this country, it would be a miracle if nobody did protest, but even if the measure did get so far, it would probably be so hedged around by restrictions put in at Committee stage that it would be impossible to make practical use of it.

Royal Park Possibilities.

This state of affairs seems to bring matters to a deadlock, but fortunately, as Lord Howe pointed out, not all the country is under the control of Parliament. The Royal Parks form an important exception, for they are administered by the Office of Works. "If it should be possible to obtain the approval of that body, with the permission of His Majesty the King," he said, "a race could be run in Richmond Park at any time. The course suggested is from Robin Hood Gate, straight across, down to Kingston and round back to the starting point."

Practising could be carried out in the early morning, and the riding and other activities which are carried out at the Roehampton end would not be interfered with. Situated within easy reach of a vast population, and run on roads which are in no sense through routes, a race held in these surroundings would, obviously, be a tremendous success."

The Wash Project.

The other hope for British racing he mentioned, is the Wash Speedway and T.T. course. The Automobile Racing Association (of which Lord Howe is a vice-president) has been making continued progress towards their goal, and though it will obviously be some time before the scheme is carried through, the facilities that will be available will be of immense value and importance to motorists, racing or otherwise.

The beginning of a new year brings with it questionings as to the prospects of the coming season. Lord Howe feels that with an improvement of trade we may look forward to an outlook at least as good as that of 1931. He is especially impressed with the progress of Grand Prix racing on the Continent, which has returned to a favour even greater than before the War, and hopes that English manufacturers will be stirred out of their lethargy to take part in these most important demonstrations of national efficiency. He admitted to an extensive racing programme himself, but is keeping quiet about the details. We put a tentative question about the 12-cylinder Alfa, which Lord Howe described as "a very going concern," but we can only possess ourselves in patience to see what surprises he has in store. Whatever forms these may take, we may rest assured that the new ventures will not fail to go quickly.

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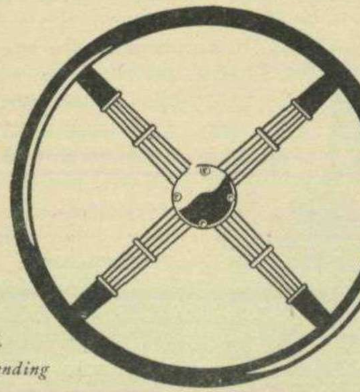

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AN INTERESTING THREE-LITRE.

THE 23.8 H.P. HOTCHKISS SIX.

Brief Specification.

Engine: 3-*litre* 23.8 *h.p. six-cylinders, push-rod operated overhead valves;* 80 *mm. bore* x 100 *mm. stroke* (3,015 *c.c.*)*; coil ignition, Solex carburettor.*

Gearbox: Ratios, 4.9, 7.9, 10.8 *and* 20.8 *to* 1*; central change. Silent third speed.*

Wheelbase: 10*ft.* 4½ *inches; track* 4*ft.* 8 *inches; ground clearance* 8 *inches.*

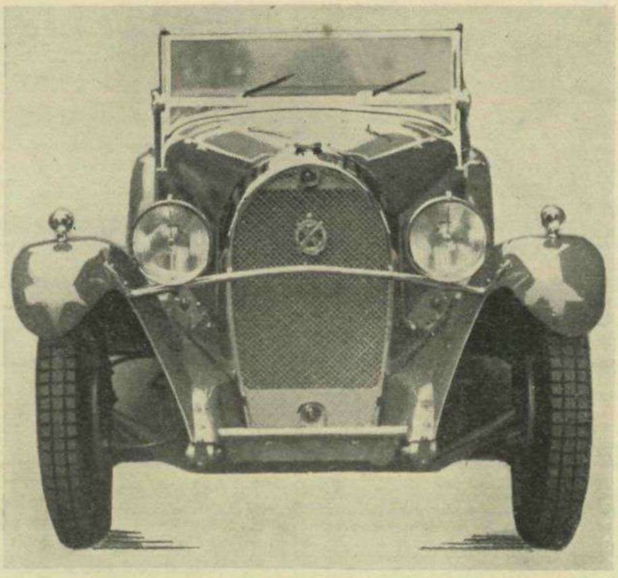
THE name of Hotchkiss has been an honoured one in the world of motoring since the very early days, and their latest product, a six-cylinder 3-litre car of typically robust construction and well thought out design, is a worthy follower of a long line of fine cars. It incorporates the best features of the continental type with those characteristics most desired in this country, and is distinctive in many ways.

For instance, although Hotchkiss is a French concern, the designer of the car, Mr. Ainsworth, is an Englishman, and the extremely modern and efficient factory is almost entirely equipped with British plant. Also, a great proportion of the material for this car is supplied by a famous British firm, and other important details, such as the large Exide battery, come from this country.

In this way it has managed to combine some of the best features of both English and Continental types, the result being one of the most pleasant cars for long fast journeys that we have handled for a considerable time.

The external appearance of the car, borne out fully by inspection of the body and chassis, would lead one to place the car in a price class approaching the 4-figure mark, though in actual fact, thanks to highly-efficient production methods, and the fact that it is one of the most popular models of its type on the Continent, the price, in spite of a recent increase, is still below £600.

The layout of the engine is extremely neat and all unnecessary excrescences have been avoided. The crankshaft is carried on seven bearings, but the length of the engine has been kept down to a remarkable extent, giving a very stiff shaft and housing, and it is to this feature that the smoothness and freedom from any "periods" in the speed range, can be attributed.



The well-balanced appearance of the 3-litre Hotchkiss is noticeable from every angle. Here, in the front view its pleasing lines are enhanced by a stoneguard, transverse wing-stay and Marchal lamps.

The overhead valves are push-rod operated, and the whole gear is extremely silent. When ticking over the only sound is that of the carburettor intake, and the flexibility is very pronounced.

At the same time there is no suggestion of a woolly engine, and it is both lively and pleasantly sensitive to the ignition without being fussy.

First gear is in the nature of an emergency ratio, such as is required on a car which is built to take the Alpine passes under all conditions without faltering, and we never found we required it. Second gear is used for starting and gives a good getaway and a maximum of comfortably over 30 m.p.h. The silent third gear is really silent, and giving as it does an easy speed of over 50 m.p.h. without noise or vibration, often leads one to forget that one is not in top gear. The gear change is dead easy from the very first time of driving the car, the lever appearing to fall into place as required without thought or effort. 55 m.p.h. was reached on third gear, and there was no sign of valve bounce.

The steering is light without being too light, and a fairly high gear and sufficient caster action makes the car very easy to handle on corners or on the straight. And the Bluemel spring steering wheel contributed to the ease of driving.

There are some fast cars which can be made to put up a high average speed and there are others, not so obviously fast, which seem to maintain a naturally high average without any real effort from the driver.

This Hotchkiss belongs to the latter class, and the longer and harder it is driven, the better it seems to go. The maximum speed on the level was 70 m.p.h., on the car tested, which was the coach-built saloon. The total weight of this car was 32 cwt., and so the figures are very good. A very attractive model on the same chassis, and one which might appeal even more to readers of MOTOR SPORT is the open 4-seater sports type which is guaranteed to beat 75 m.p.h. against the watch in standard trim, and being considerably lighter will have even better acceleration.

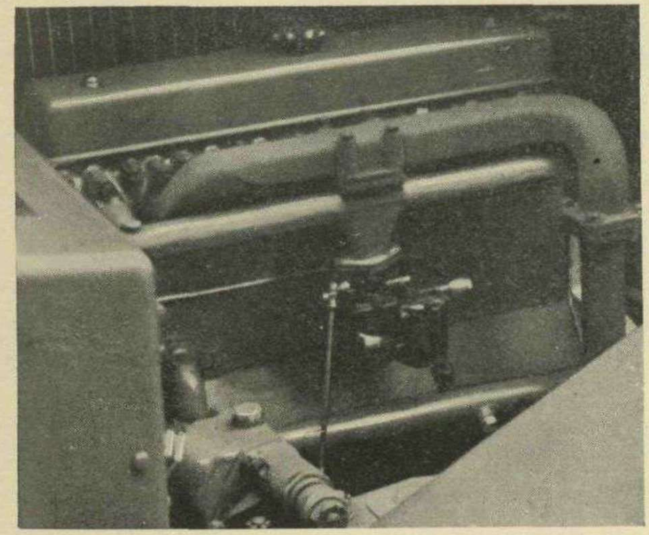
The suspension and road holding is really first class, a further requirement of a people who consistently drive their cars flat out over every type of surface, and who have no time whatever for a car which tires after a few miles of full throttle.

A cruising speed of 65 m.p.h. can be obtained indefin-

AN INTERESTING THREE-LITRE—continued.

itely wherever traffic permits, and a long run leaves the driver perfectly fresh.

The brakes are direct operated through the patented Hotchkiss mechanism, and give positive and even braking at all speeds without undue pressure, and without any tendency to lock the wheels or affect the control.

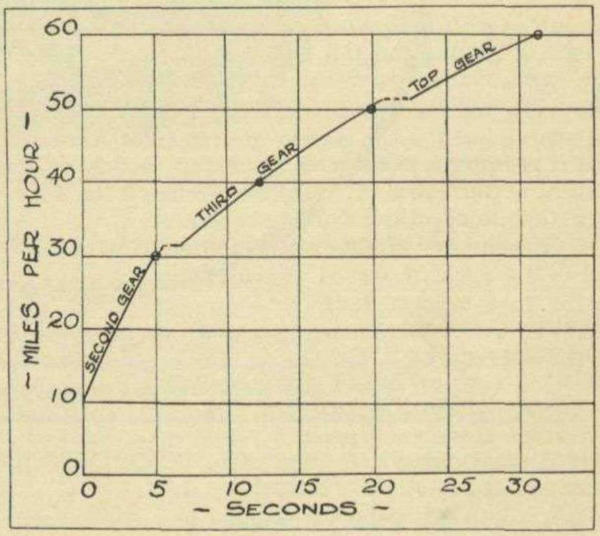


A typically continental job, the engine is noticeably clean and accessible.

The electrical equipment is well thought out and separate fuses are mounted in an accessible position on the dash for all lights. The Marchal lamps, for which the switch and dipping control is mounted next to the right hand and easily operated without moving it from the wheel, give an exceptionally good beam which enables high averages to be maintained at night. The dimming arrangement is probably the finest yet produced.

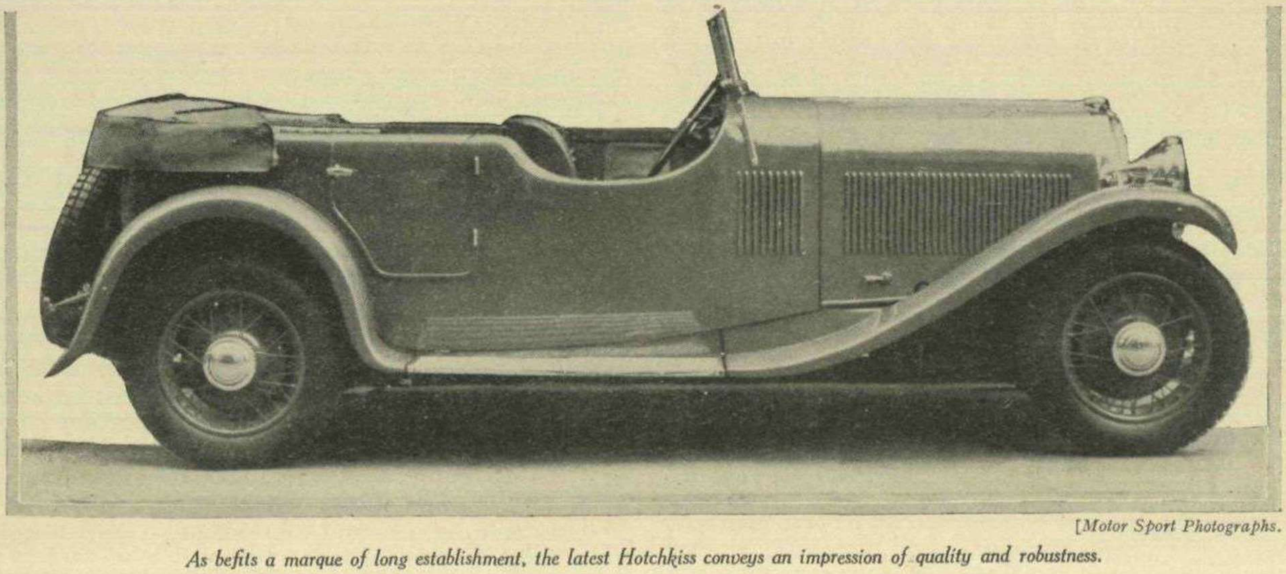
Although the car we tried had covered an enormous mileage, the body was as silent as when new, which is a great tribute to the strength and quality of the whole vehicle. The Solex carburettor functions excellently, and gives a consumption of 20 m.p.g. while oil is only required when the sump is drained and refilled occasionally.

A braking distance of 65 ft. from 40 m.p.h. is obtainable without harshness, and could probably be improved. The whole car is a high-class production which should make a strong appeal to the man who wants to go fast and far, and at the same time be free from trouble and expense, and have a minimum of routine work to keep the car in good trim.



A graph showing the car's acceleration ability in its various gears.

The Hotchkiss is handled in this county by Hotchkiss et Cie, whose address is 70, Vauxhall Bridge Road, London, S.W.1.



[*Motor Sport Photographs.*

As befits a marque of long establishment, the latest Hotchkiss conveys an impression of quality and robustness.

WINTERTIME IS TUNING TIME

AT this time of the year many owners are thinking out plans for their next season's motoring, and as the result of their own experience, or that of their friends, decide on various modifications to their vehicles which they hope to carry out. Unfortunately in many cases the affair remains in the hope stage owing to the natural human tendency to put off doing anything until it becomes urgent.

If this practice is followed with the car, the season comes round once more without anything having been done to get the car in trim, and the various specialists in the class of work required are all " up to their necks " in special work for the racing season. This means that prompt execution of work is difficult, and there is no chance of getting the job done at a reduced figure, as will often be the case in the winter months.

No sane man would advocate giving up motoring in the winter, but if a car is to be got into such a condition that it is really a pleasure to drive and well above standard in performance, it has got to come off the road at some time to allow the work to be done.

It is therefore obviously sensible that it should be laid up for such time as is necessary when the use of it on the road is least desirable.

It is not only the racing man who will be getting ready for the season, and in his case the car is not likely to be the one he will use for ordinary work, and it will probably be still in course of preparation. The man who owns a sports car and who motors both for business and for the sake of driving, with perhaps an occasional competition thrown in, has to consider with equal care the preparation or alteration of his car.

Renovations and Additions.

If his car is an old one he will almost certainly have noted down various points in which it can be improved. He may have already hotted up the engine to some extent, but some sort of overhaul will probably be required, and if it is undertaken now he will be sure of more individual attention being given to his job, and he will have it back in plenty of time to get it thoroughly run in, before more strenuous motoring is indulged in.

If the cylinders are getting worn it will be a good opportunity to have hardened liners fitted, while various other special parts on which he has decided can be made and fitted without rushing the job.

There are hundreds of little points which distinguish the enthusiast's car from a standard model, and nearly all of them take time and thought, while the actual cost is often quite small. Items like reserve oil tanks or a larger petrol tank for the long-distance fiend, modified lighting arrangements, altered driving position and pedal positions, as well as the fitting of useful accessories, all make the car specially useful and distinctive, instead of being " just a motor-car."

Even if the car is new, these points apply equally strongly, while there will be the additional job of really getting down to making the engine do its stuff in a non-standard manner.

Here the importance of " doing it now " cannot be too well emphasised, for nothing is more disappointing to find than when the first occasion arises for a really long fast run, say at Easter, the engine is only just ready for the road and has to be run at about 35 m.p.h. or so as the limit, till it has settled down.

Running-in.

All this running-in can be very well accomplished, and is far better for the engine, by the comparatively dull day-to-day running of the next month or so, with an occasional burst to get the feel of the motor, and to see how it is progressing. Then by the time the car is wanted for fast work it will be ready.

However, engine tuning is only one side of the question, and the less exciting, but no less important items of brake relining and steering overhauls are among the numerous jobs which are best done at this time of year. Special fittings, be they high efficiency cylinder-heads, different carburettors, or new shock absorbers, should be obtained as soon as decided upon, for to wait is only to lose their advantages for a considerable time without any saving in cost.

The various well-known firms who cater for the sports car owner, whether competition man or ordinary owner, are all able to give better and more individual service in the slack season, and this should be utilised.

If you take your car in now you will not only save time and money, but it will be really ready for work when you most need it.

We append a list of some prominent firms who specialise in overhauls and tuning :

Henry Birkin and Couper, Ltd., Welwyn Garden City, Herts. General overhauls and preparation for racing of all makes, and experimental works.

Thompson and Taylor, Ltd., Brooklands Track, Weybridge, Surrey. Overhauls and tuning for racing.

R. R. Jackson, Brooklands Track, Weybridge, Surrey. Sports car maintenance and preparation for competitions.

Laystalls, Ltd., Ewer Street, Southwark. Overhauls, including fitting cylinder liners, engine testing, and manufacture of special parts.

Barimar, Ltd., Lamb's Conduit Street, W.C.1. Welding specialists. Also cylinder grinding and fitting liners.

M. A. McEvoy (London) Ltd., 146, High Street, Notting Hill Gate. Specialise in overhauling and special tuning for Morris, M.G., and Wolseley Hornet.

V. W. Derrington, 159, London Road, Kingston-on-Thames. Tuning, overhauls and special fittings for M.G. and Wolseley Hornet.

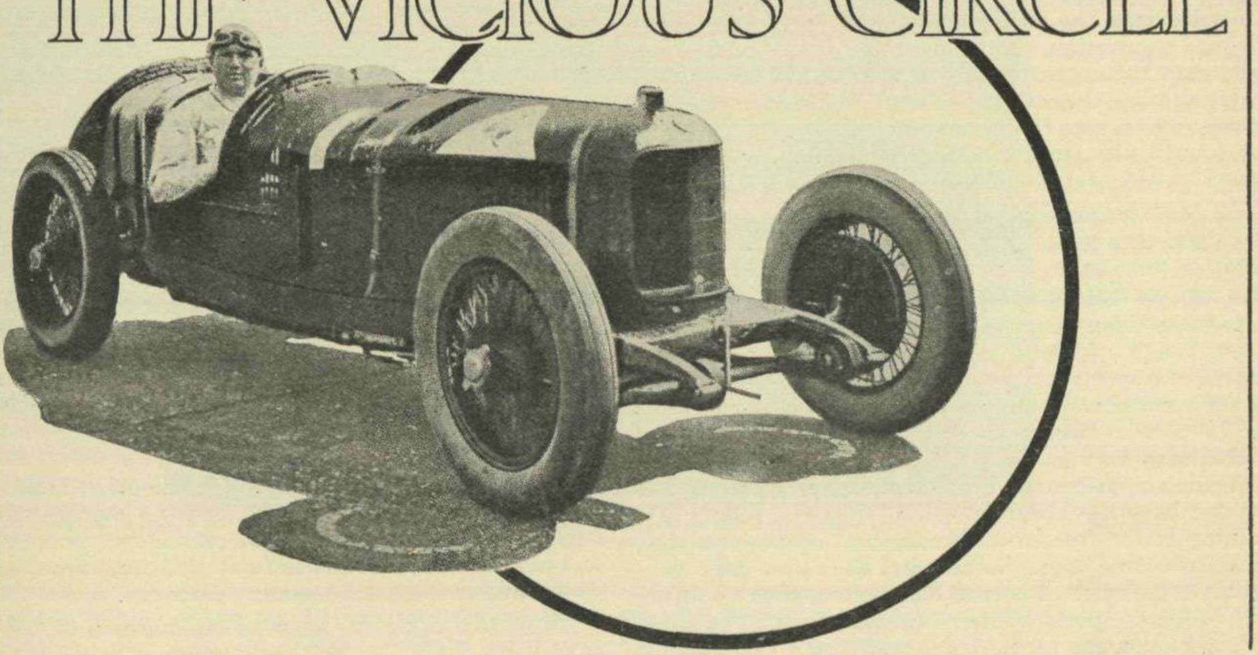
A. F. Ashby, Watford Way, Hendon. Riley and Austin specialist. Agent for Whatmough cylinder heads. Overhauls and racing tuning.

Jarvis and Sons, Wimbledon. M.G. specialists and agents. Tuning of all models.

H. J. Ripley, Providence Works, Thames Ditton, Surrey. Riley and Austin overhauls and tuning.

Manor Motors Ltd., Motcomb Street, Knightsbridge. Bentley spares and service.

THE VICIOUS CIRCLE



ANOMALIES IN OUR RACING RULES AND REGULATIONS.

TO the student of motor-racing history, the year 1931 will stand out as a turning point in the long-debated question of whether races for specially-built racing cars or for standard sports cars are the most beneficial from the point of view of improving the breed.

So long as the French Grand Prix retained its place as the most important event on the racing calendar, it was generally conceded that " the racing car of to-day is the touring car of to-morrow." In 1925, however, when the post-War boom in business began to wane, and the competition in selling ordinary cars became keener, it was discovered that the expense of building and preparing a team of specially-made racing cars was not a commercially sound proposition. The inevitable result was a falling-off in the entry lists of such races as the French Grand Prix, and the realisation that unless some drastic step was taken, motor racing was likely to die out altogether.

The obvious course to adopt was to organise races for production sports cars, and with the characteristic habit of human nature of turning a necessity into a virtue, people discarded the old theory that racing cars improve the breed, and comforted themselves by asserting that in this way the sports car would find a quicker impetus towards perfection.

Production car races were not new. In 1922 and 1923, the Grand Prix de Tourisme had been run as a sort of curtain-raiser for the French Grand Prix, while since 1923 the A.C. de l'Ouest had run the highly successful 24-hour race at Le Mans for the Rudge-Whitworth Cup. The old Grand Prix races were quickly forgotten, and the Le Mans Race became the most important event of the year. The rest of Europe soon followed suit, and England had her 6-hour race and later the Double Twelve, Italy the 1,000 Miles Race, Belgium her 24-hour Race, and Ireland organised the Dublin Grand Prix and the Tourist Trophy Race. One race alone, as if to assert the truth of the saying that there must be an exception to prove the rule, remained unchanged, the classic and inimitable Targa Florio.

Now let us turn to another aspect of the case, the cars themselves. At the end of the " racing car era," the peak of development had been reached in such designs as the 2-litre 8-cyl. Alfa-Romeo, the 1½-litre 8-cyl. Delage, the 2-litre 6-cyl. Sunbeam, and the 2-litre 8-cyl. Bugatti, all of these cars being supercharged. An attempt at building the fastest possible road car, irrespective of size, was the 12-cylinder 4-litre Sunbeam, which was in essentials two of the 2-litre engines installed in a larger chassis, although the two cylinder blocks were on a single crankcase.

At the beginning of the " sports car era," the most efficient designs used were the 3-litre 4-cylinder Bentley and the 6-cylinder 3½-litre Lorraine. Both these cars were highly efficient touring machines, capable of propelling a full-sized body at a high average speed, and were, in marked contrast to the racing cars quoted above, tractable to drive.

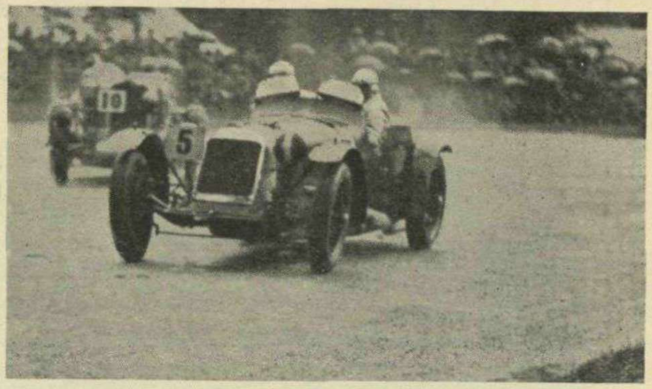
Now let us follow the development of the cars used in these " production car races." Competition was keen, and it soon became apparent that cars like the 3-litre Bentley and the Lorraine Six were not fast enough. Designers had to find means of improving the performance of their cars, and where else could they look for

THE VICIOUS CIRCLE—continued.

knowledge but to the old Grand Prix racing cars? Engines of six and eight cylinders became the rule, and supercharging, the use of multiple carburettors, hemispherical combustion chambers by means of double overhead camshafts, greater care in weight distribution and in determining the centre of gravity, and vastly improved brakes, all became the normal attributes of the "sports car," until now, in 1932, maximum b.h.p. and a high power-to-weight ratio are at a premium, while tractability counts for nothing at all.

And so the cycle is completed. The most highly developed "sports cars" of 1931 season were the 2.3-litre, 8-cyl. Alfa-Romeo, and the 2½-litre Maserati, in fact the Grand Prix racers of 1925 camouflaged with sports bodies in order to comply with the rules and regulations of "sports car races." To make the resemblance to the conditions obtaining in 1925 still closer there is the 12-cylinder twin-engined Alfa-Romeo, a car powered in a similar way as the old 12-cylinder Sunbeam, and possessing approximately the same performance. To-day we have the absurd position of pukka racing cars running in the free-for-all Continental events equipped with streamline racing bodies, and the same cars competing at Le Mans, Phoenix Park and Belfast complete with 4-seater sports bodies. In other words, progress by production car racing has resulted in a car which is identical with that produced by years of racing with special cars, and has produced a car that is not, as far as all round performance is concerned, a *sports* car.

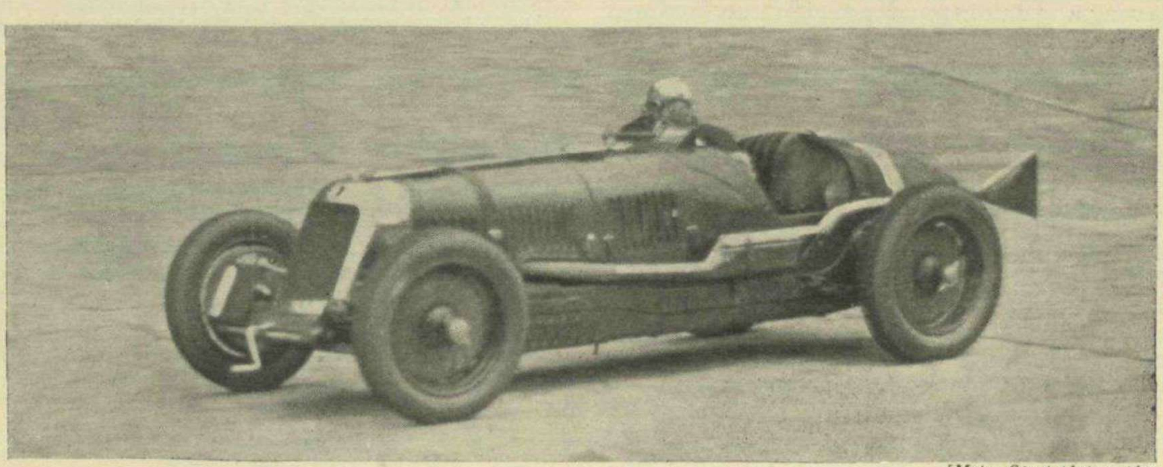
The truth of the matter seems to be that the racing car and the sports car are fundamentally different types. It may be argued that the average performance of cars in general, and of sports cars in particular, has improved vastly in recent years, as is admirably proved by a comparison between the 1925 3-litre Bentley and the 1931 3-litre Talbot. Furthermore, it may be contested that in time, production cars will have the same degree of efficiency as racing cars. While admitting the improvement in performance however, to anyone who has handled a racing car it will be obvious that such fierce acceleration, such lightness and accuracy of control, such refined *roadworthiness*, can never be possessed by a docile, high-speed touring car. On the other hand, the same driver will have to admit that no racing car will ever have that same degree of reliability, smoothness and ease of control under normal road conditions, as he would find in a typical modern sports car.



G. E. T. Eyston's Maserati in the 1931 Irish Grand Prix. Except for its regulation wings and skimpy equipment it is practically identical with the car illustrated below.

All of this brings us again to the question of "What is a sports car?" It is a term which is so loosely and widely applied that its meaning is now very indefinite. The type, as at present conceived would appear to fall under two main headings. First, the car which, by reason of its capabilities of sustained speed, good roadholding, acceleration and general safety appeals to the connoisseur of motoring, who requires something out of the run of utility vehicles, and which will give pleasure in actual driving as well as being a sound means of transport.

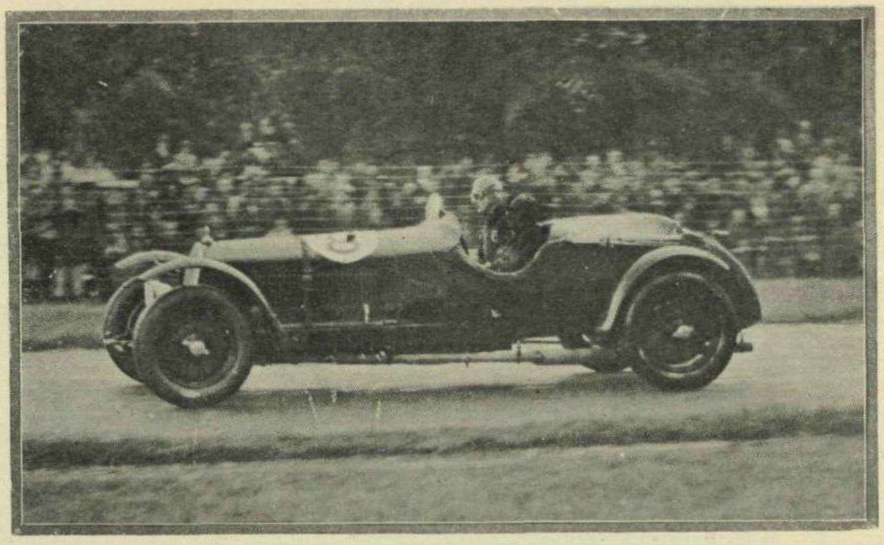
To the type of driver who requires such a car, ordinary competition work or racing has an appeal only as a spectacle with a technical interest. He will regard the success of a particular firm as evidence of their knowledge of the requirements of high-speed work, and if a suitably modified standard model is on their lists he will buy it. He does not, however, wish to compete in person.



[Motor Sport photographs.

Sir Henry Birkin drives a Maserati at the track. The addition of wings, lamps, etc., at once makes this full-blooded racer eligible for participation in road events.

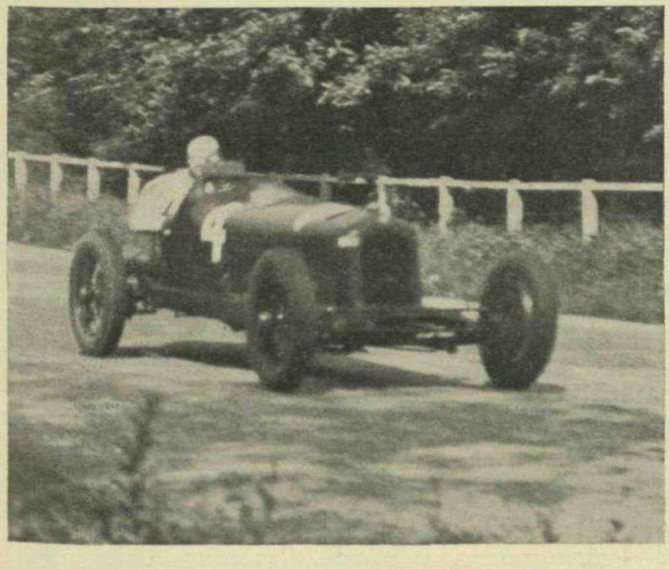
THE VICIOUS CIRCLE—continued.



Two photographs which bear out the the assertion made by our contributor. Above—Sir Henry Birkin's Alfa-Romeo equipped with a "touring body" at Phoenix Park, and below—a similar chassis in its natural racing state in the French Grand Prix. A further comparison of the latter car with the 1925 racer depicted at the head of this article illustrates the contention that racing either with production machines or specially-built racers has resulted in a chassis of virtually the same design. (*Motor Sport photographs*)

The second type of sports car is the replica of the actual racing machine, sold in a form suitable for partaking in races with a good chance of success, and the more genuine it is as a replica, the less suitable it is for normal use on the road. This type should not be called a *sports* car, as it is actually a production racing machine. When it is necessary to change to a different type of plug for traffic work to that which will stand full throttle on the open road, it is no longer correct to call the car a sports car, however many have been sold to the public.

As has been already pointed out, races for cars based on standard productions have made the game financially possible to many who would otherwise be barred.



Nevertheless modifications are, and must be, allowed and the resulting cars are racing models in spite of their bodywork and mudguards. The fact that some cars must have been sold to the public stops the price from becoming entirely prohibitive, though in some cases it is high enough, and thus enables the amateur to buy a racing car. At the same time greater freedom in modifications from standard are necessary to research, and will automatically bring the races back to the conditions of the undisguised racing car events of the past. This is borne out by the decision of the R.A.C. to allow cars to run in next year's T.T. race without windscreens, wings, hoods or lamps.

To those who will cite the magnificent performance of the Talbots in the recent 500 miles race as an example of docility and quietness combined with a very high maximum speed, I would reply that (a) the Talbot is not a fair example, as no one, except its brilliant designer, Mr. Georges Roesch, knows how it obtains its performance, and that (b) the same car is somewhat overshadowed by a racing car on a road circuit.

Will 1932 see the last of sports car racing? It certainly seems so, except for the fact that so far as British firms are concerned, the building of production racing models is not a paying proposition. In fairness to ourselves, however, it must be added that it is rumoured that Italian manufacturers are financially subsidized by the Government. Meanwhile, we shall continue to hear complaints from the uninitiated because our wealthy drivers "buy foreign." Our only hope seems to be that, as was suggested by a reader in the correspondence columns of MOTOR SPORT recently, the benevolent assistance accorded to the Schneider Trophy Contest and the motor-boat speed record attempt may one day be extended to the production of a team of British racing cars.

H. F. L. N.

HOME-PRODUCED MOTOR SPIRIT.

THE motor industry will be interested in an announcement made by Sir Eric Hambro at a luncheon in London, in honour of Commendatore Salerni, whose Low Temperature Carbonisation system was declared at the World Fuel Congress at Pittsburgh to have proved successful. By this system, oils and motor fuel of the requisite quality can be produced from any bituminous coal and Sir Eric is shouldering the responsibility of the initial finance to start this new industry.

How dependent Britain is on imported oils is evident from the fact that during 1930, nearly two and a half thousand million gallons of mineral oils were imported into Great Britain. The treatment of only 15 per cent. of the total coal produced yearly in Great Britain would mean the production, in addition to two million tons of fuel oil for the Navy of one hundred thousand gallons of motor spirit. The significance to the motor industry in this discovery is therefore obvious.

A NEW-SEASON HORNET ON THE ROAD

THE ABBEY A.S. 3 UNDER TEST.

THE rapidity with which the Wolseley Hornet in standard, sports, and "special" form, rose in popular favour was one of the outstanding features of the past season. Its sales figures during 1931 must have been phenomenal, and one would hazard a guess that they exceeded the expectations of Sir William Morris himself, who perhaps, better than any other manufacturer is able to gauge just what the motoring public wants or does not want.

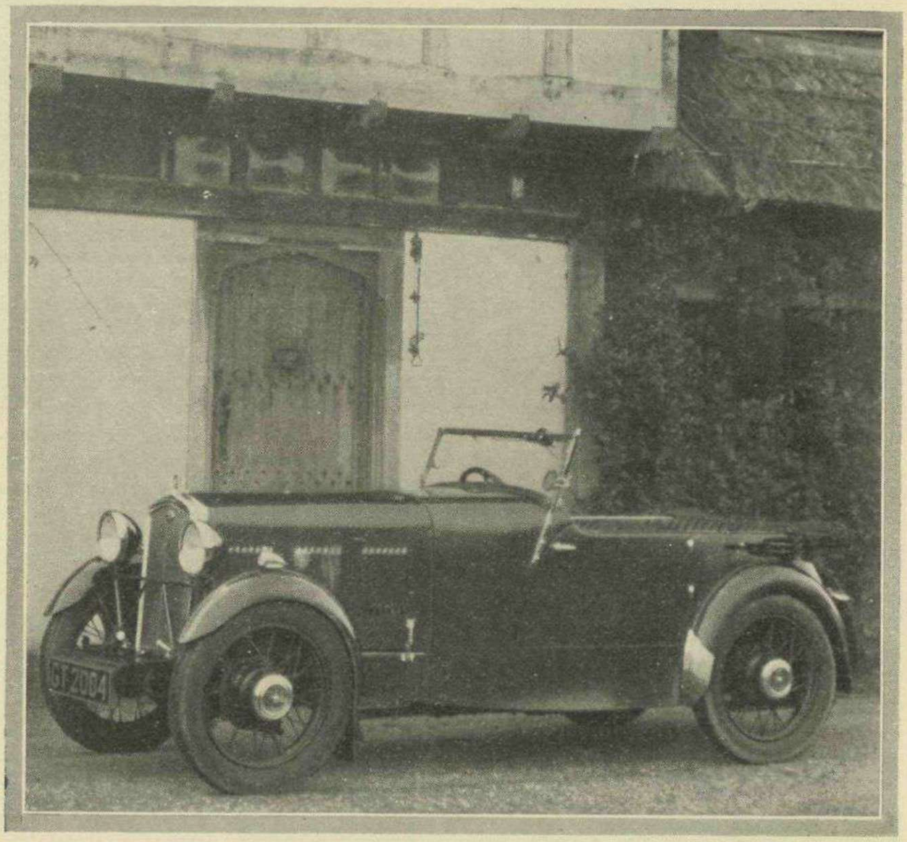
What was never anticipated when the Hornet was shown for the first time at Olympia, was that it would be seized upon by various enterprising body-building concerns as a very sound basis for special sports models, but now that the qualities of this attractive small six have been revealed it will surprise nobody if 1932 will see even more of these cars on the road.

As far as this Hornet Special vogue is concerned, credit must be given in the first place to Abbey Coachworks, Ltd., for being the originators in adapting the chassis for sporting purposes, and the success they have achieved in their venture is well deserved, for their 1931 Hornet models besides being exceedingly pleasing in lines, also embodied detail refinements and extras which brought it out of the run of the usual production-utility job, and made it a "special" in something more than name.

This care in preparation and quality of workmanship remains in the latest Abbey Hornet, as we found when we tried an A.S.3 model a short time ago.

As can be seen from the accompanying illustration, this car has a body of the popular occasional-four variety, devoid of running boards and with close-fitting cycle-type wings of deeply domed section.

Standardization of methods in body building has, to a large extent, eliminated the individual "touch" from a vast number of present-day cars, but in the Abbey, one is aware of it at once. It is not that there is anything grotesque or freakish about its design ; far from it. It is in the way the whole is built up, with quality as a salient characteristic, which one cannot fail to overlook. There are no ugly gaps in the panelling, crudities, or odd excrescences which would break up the sleek lines of the model, and the impression one gains is that it is a solid, sound piece of work, built to last and withstand the rough-and-tumble which is the lot of the average sports machine. In point of fact, the A.S.3 body consists of one complete, welded, aluminium shell mounted on an ash frame and bolted to the chassis frame at half-a-dozen points, and this design, undoubtedly, is responsible for its rigidity and freedom from distortion.


[Motor Sport Photograph.

The A.S. 3 type Abbey Hornet in 1932 form.

The equipment in general is in keeping with the rest of the car, with a windscreen of the racing single-panel type, made to drop flat on the scuttle and open upwards. The seats are upholstered in good quality hide (with Moseley pneumatic cushions) and they are easily adjustable for leg room. The steering wheel is a 17 inch spring-spoked Bluemel, and the facia board has a black ebonite finish with the usual instruments arranged in a well-balanced way so that they are easily discernible to the driver.

In action, we found the A.S.3 a most likeable little vehicle, and it behaved just in the way which its appearance, and our previous experience with Hornets had led us to anticipate. Steering, brakes and clutch were all very light and easy to manipulate, and particularly in second speed its acceleration was distinctly invigorating. The latest Hornet is, of course, now fitted with a four-speed gear box, and when used intelligently, the presence of the

A NEW-SEASON HORNET ON THE ROAD—continued.

extra ratio makes a marked improvement in its performance, which is noticeable both in town driving and when out on the open road. The gear change is very quick, and going from third to top and vice versa can be made a very snappy movement indeed.

During our test run, we had an opportunity of discovering how much attention had been paid by Abbey Coachworks Ltd., to the matter of weather protection as for about three hours we drove through heavy rain. And what we found was all in the manufacturers' favour. The hood is a genuine "one-man" affair, and having removed its cover, we had it up in a matter of seconds (without pinching our fingers). Although side curtains were provided we did not use them, but we nevertheless found that we were quite snug in spite of the wind and the rain. Tandem wipers are part of the A.S.3's standard equipment, and these we found very beneficial in giving good driving vision, especially after dark.

The itinerary which we covered embraced, for the most part, secondary roads of such a nature that the car's road-holding qualities were brought into relief. And taking into consideration that the Hornet was not built in the first place as a sports model, its behaviour was exemplary.

Of criticism we have little to offer, save that the second speed ratio seemed unduly low, and that, as with 90 per cent. of "occasional four" bodies, the accommodation in the rear compartment was somewhat inadequate for two adults. But then, of course, it *is* an *occasional* four.

As the car (which was loaned us by E. C. Stearns and Co., of Fulham Road, who are the sole London agents for this car) was virtually brand new, we did not force it up to its limit. All the same we found that 60 m.p.h. over long stretches of undulating highway could be maintained without butchering the engine and 70 m.p.h. was touched when conditions permitted. A check of the braking capacity, showed that from 40 m.p.h. to rest, sixty feet was required.

The price of the Abbey A.S.3 is £235, which, after all, is not at all an exorbitant figure.

No contortions are necessary in making one's entry or exit from the driving seat of the Abbey A.S.3, thanks to the ample width of the offside door.

Mr. G. E. T. EYSTON'S PLANS.

THE future plans of Mr. G. E. T. Eyston, who has now recovered from the injuries he received when his car burst into flames while travelling at 102 m.p.h. at Montlhéry, have inspired many rumours.

Eyston has now revealed that in the near future he intends to make a number of fresh record breaking attempts.

"In the early spring I intend to go to Pendine Sands," he said, "where I shall attempt to beat the existing mile and kilometre records in an M.G.

"I shall also endeavour to raise the world's baby car record of 110.28 m.p.h. at Montlhéry. This record was set up, of course, by Eldridge, a former holder of the world's speed record. In addition, I shall go for a number of long distance records, and shall participate in as many Brooklands and International road races as time will permit."

Eyston emphasised the fact that his records have almost all been obtained in three makes of perfectly standard, medium priced sports and touring cars of English manufacture.

FORTHCOMING EVENTS

INTERNATIONAL FIXTURES—1932

JANUARY.

10th. *Latvia—Coupe d'Hiver.*
15-20th. *Monaco—Monte Carlo Rally.*
24th. *France—Course du Mont des Mules.*

FEBRUARY.

6-7th. *Germany—Internationale Winterfahrt Garmisch-Partenkirchen 1932.*
28th. *Sweden—Grand Prix d'Hiver de Suede.*

MARCH.

18-24th. *France—Paris-Nice.*
24th. *France—Course de la Turbie.*
27th. *Italy—Circuit d'Alessandria.*
27th-2nd April. *Germany—Sechstagefahrt fur Kraftwagen auf dem Nurburg-Ring.*

MARCH.

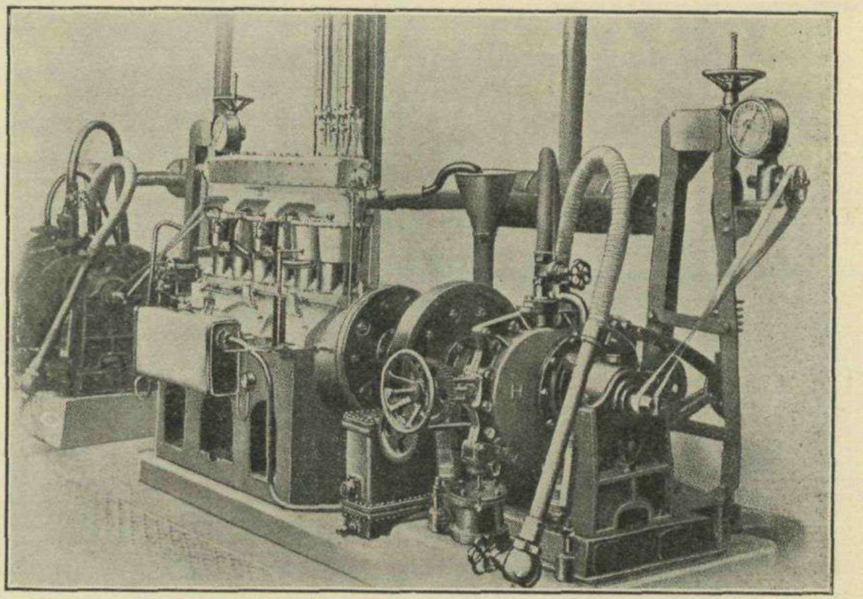
28th. *Great Britain—B.A.R.C. Meeting (Brooklands).*

APRIL.

3rd. *France—Grand Prix de Tunisie.*
9-10th. *Italy—Coupe des Mille Milles.*
16th or 23rd. *Great Britain—British Racing Drivers' Club Race Meeting (Brooklands).*
17th. *Monaco—Grand Prix de Monaco.*
23rd-24th. *France—Grand Prix de l'Oranie.*
24th. *Italy—Prix Royal de Rome.*
30th-5th May. *Germany—Internationales Wiesbadener Automobilturnier.*

"B.H.P." AND HOW IT IS FOUND

TYPICAL EQUIPMENT OF THE TEST SHOP



An engine ready for test—in this case a Siddeley "Puma" aero unit—coupled up to a dynamometer.

IN the complicated and intricate process of automobile production there is, perhaps, no more interesting or essential branch than that of engine testing.

When a designer, after prolonged thought and careful calculation, has ultimately placed his plans on paper, and when the multitudinous operations have been carried through so that from the raw material the completed article has been evolved, the success or failure of his ideas is soon revealed in the test department. Naturally, the acid test is found in the conditions met with on the road, or better still in racing, but without the aid of the "bench" no manufacturer could hope to obtain the all-round efficiency which the exacting conditions of present-day needs demand.

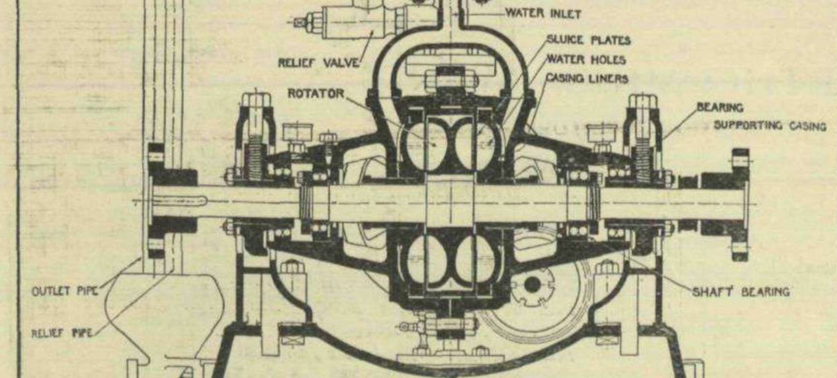
In by-gone days when the motor car engine was a stolid worker of moderate revs., the designer had a relatively easy task, but to-day the high-speed engine, which is now universally used, calls for intense accuracy and the working to fine limits, and this precision has to be carried through to the very last stage, which is reached in the test shop.

The work in this department consists in the main of checking the power output of engines, though it is obviously also concerned with fuel and oil consumption, stamina, balance, running-in and so forth.

But the chief job, in dealing with standard-built engines, is to see that the power and revs. are there. This is done by the aid of a dynamometer, known more familiarly as "the brake." The dynamometer, like the engines for which it has been evolved to test, has progressed considerably in recent years, and bears but scant resemblance to the apparatus of long ago.

The hydraulic brake type of dynamometer, which is the one most generally in use, consists primarily of a turbine or rotor running within a casing; the former is provided with vanes facing forward in the direction of rotation, and corresponding with similar vanes cast on the inner surface of the casing. The casing vanes, however, are formed so as to face backwards, against the direction of rotation. Situated between the two vanes (those on the casing and those on the rotor) are a series of movable sluice plates, which can be adjusted by means of a hand wheel.

The outer casing is supported on ball-bearing trunnions, and attached to it is lever arm which extends horizontally, and which is coupled at its extremity to a weighing machine. The shaft of the rotor is coupled to the engine under test by a suitable universal joint, and when in action the water, which is fed to the interior of the dynamometer, is forced very rapidly from the moving vanes to the casing vanes and vice versa, with the result that whatever force is exerted to turn the rotor, tends with precisely equal force to move the casing on its mounting. It will be obvious that this movement is then transmitted via the horizontal arm to the weighing machine, which being suitably graduated, at once shows the Brake Horse Power (B.H.P.) which is being produced by the engine. The object of the adjustable sluice plates is to reduce the power absorbed by the dynamometer and this is done by moving them so that they cut off a portion of the effective area of the annualar channels formed between the blades. In this way the power may be reduced from the maximum down to about one-thirtieth of that amount.



Sectional drawing of the Froude water brake dynamometer.

A further development of the brake is found in the Heenan and Froude Electro-dynamometer, which in addition to serving as an indicator of an engine's power output at various speeds, also motors the engine during the running-in process. The usual practice at one time in driving or motoring a new or repaired engine was to use an ordinary electric motor, but owing to the fact that the torque is uncontrolled, and any stiffness or tightening up in the engine consequently overcome with some violence, damage to the wearing surfaces often resulted. With the Heenan and Froude appliance this running-in

"B.H.P." AND HOW IT IS FOUND—*continued.*

work is done at first at a low speed, and at a torque which adjusts itself automatically according to the freeness or otherwise of the engine. As the bearings settle down, and the engine becomes less stiff, the Electrodynamometer increases its speed to complete the process, and when a predetermined state of freeness has been reached and the engine is ready to run under its own power, the moment is indicated by a signal.

During the whole period of running-in, a dial shows the exact degree of internal stiffness of the power unit, and thus the operator can tell at once how it is shaping.

As soon as the running-in process has been completed, the engine is allowed to work on its own account; at first it is set to run light only, in order to allow the pistons and rings to accommodate themselves to the resulting expansion. Later the throttle is gradually opened and the endurance and power tests begun. While this operation is going on the Electrodynamometer converts the power given off by the engine into electric current which can be either dissipated through a series of resistances, or switched over into the factory's main electrical supply.

As with the water brake, the torque of the engine is visually indicated on the dial of the weighing device throughout the whole period of the test, and the engine revolutions are shown by the usual tachometer.

The electrical brake has much to commend itself, since it is clean, simple and has a high degree of elasticity, but this apparatus of Messrs. Heenan and Froude is remarkable on account of the fact that the whole work from the time the running-in process is begun till the engine has completed its power tests is carried out practically automatically.

NEW MOTOR REGULATIONS

CLAUSES WHICH NOW TAKE EFFECT.

THE Automobile Association draws attention to the following new Regulations affecting motorists and which come into force to-day, 1st January.

Mirrors.—Every motor vehicle (motor cycles excepted) must be fitted with a reflecting mirror so that the driver may be acquainted with the proximity of vehicles about to overtake. Vehicles drawing trailers are exempted if the attendant on the trailer has an uninterrupted view to the rear and is able to communicate with the driver.

Windscreens.—All glass fitted to windscreens or windows facing to the front on the outside of any motor vehicle, except glass fitted to the upper deck of a double decked vehicle, must be safety glass. Vehicles registered before 1932 are exempt until 1937, but, meantime, the glass fitted (safety or otherwise) must be maintained in a condition which does not obscure driver's vision. "Safety glass" is defined as glass which, if fractured, does not fly into fragments capable of causing severe cuts.

Springs.—Motor vehicles (except motor cycles or mobile cranes) registered after 1st January, 1932, and any trailer constructed after 1st June, 1931, must be equipped with suitable and sufficient springs between each wheel and the frame of the vehicle. Tractors not in excess of 4 tons unladen weight are exempt if unsprung wheels are fitted with pneumatic tyres.

Taxation.—Motor cycles, the cylinder capacity of the engines of which do not exceed 150 c.c. will pay the reduced annual tax of 15s.

The Motorist's Legal Guide, available free of charge to A.A. members, deals with these points and many others of prime importance to motor owners. Any motorist who is in doubt as to the effect of the new Regulations should communicate with the A.A. Legal Department, Fanum House, New Coventry Street, London, W.1.

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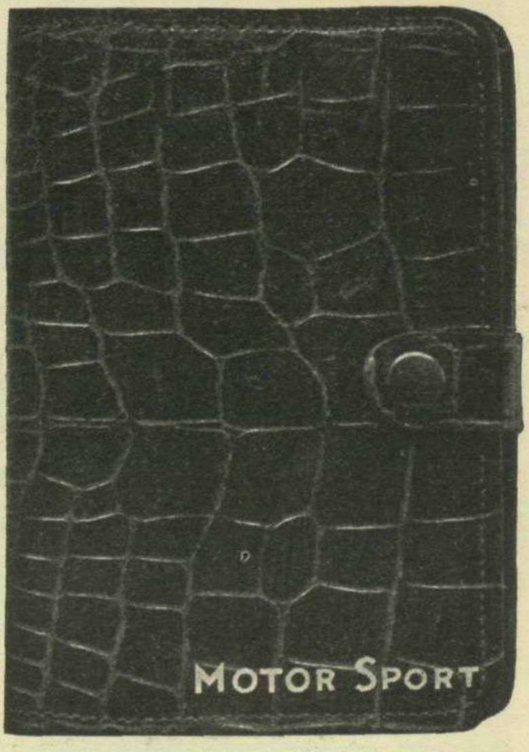
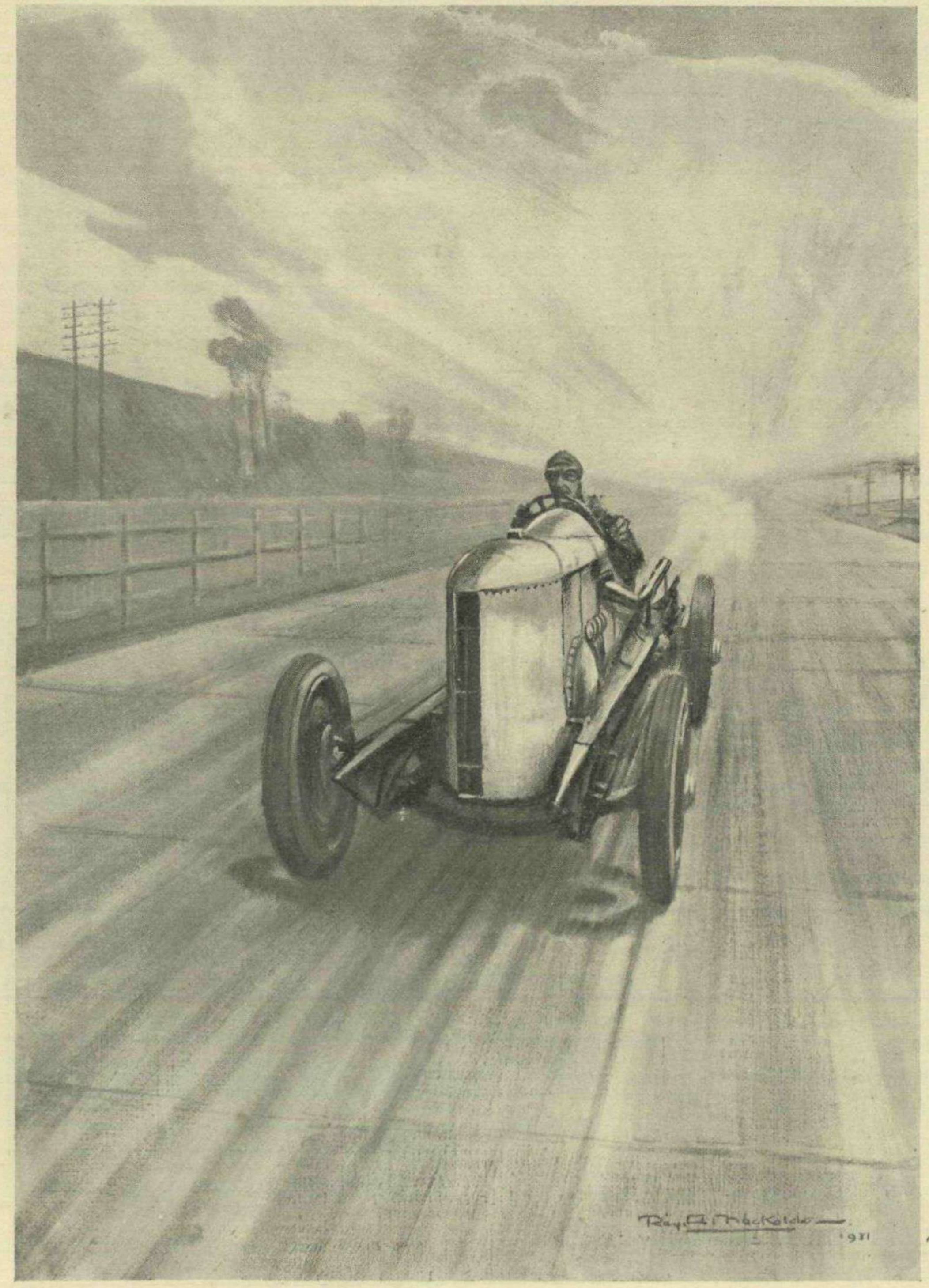
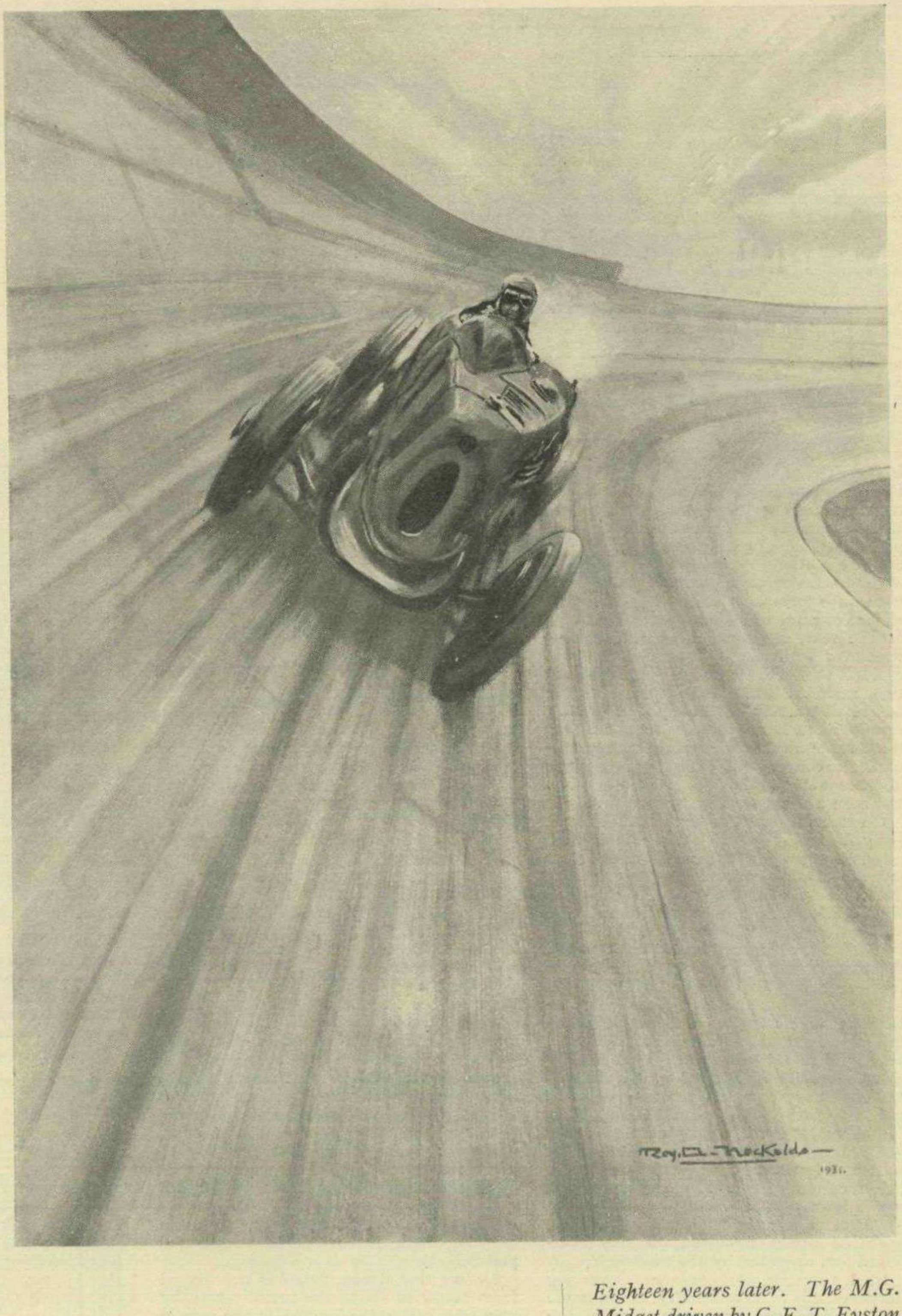


ACTUAL SIZE

1913

A milestone in motoring history was established on 15th February, 1913, when the late Percy Lambert in a 25 h.p. Talbot set the hour record at Brooklands at 103.84 m.p.h. On the same occasion he covered the 50 miles in 29 minutes 2.5 seconds and the 100 miles in 57 minutes 49.38 seconds.





1931

Eighteen years later. The M.G. Midget driven by G. E. T. Eyston at Montlhéry covered 100 miles at a speed of 100.09 m.p.h.—an outstanding performance for a car of only 750 c.c.

MODERN FUEL FEED SYSTEMS—

AND SOME DEVICES WHICH ENSURE TROUBLE-FREE MOTORING.

WHEN in the course of some race or competition, mechanical trouble forces one to retire, the more trifling or obscure the cause the greater one's disappointment and chagrin.

A major fault in one's car, such as a broken connecting rod, even though it wipes success from a driver's grasp can be accepted with resignation ; not so, if the reason for withdrawal is ultimately traced to dirt in the fuel supply or a broken feed pipe, for it is then that one realises that a little more care, a little more forethought would have obviated the trouble.

Nearly every car-owner has experienced, at some time, the usual choked jet, and it must often appear that this occurs at the most inconvenient moment—generally when one is in a hurry—and if this is the case, it is obvious that the reason is that, in being driven hard, the engine requires the fuel at a greater rate, and thus any accumulated dirt in the tank or pipes is suddenly drawn up by the increased suction and causes a stoppage.

Fuel starvation is, perhaps, more common in sports machines than in other classes of cars, and when the tank is fitted at the rear, the obstruction, air-lock or whatever the cause may be, is sometimes difficult to trace. Rear tanks are used for two main reasons—to obtain a lower centre of gravity and to give a greater supply of fuel. Obviously with the rear tank some means of feeding the petrol to the carburettor is called for, and it is in these methods that the last season or so has seen a great deal of change.

On normal cars the vacuum tank held sway for many years, but it has marked disadvantages for sports car use or for any car which is continuously driven hard. The principle of the vacuum tank, as will be known to all motorists, is that the suction on the induction pipe is utilised to raise petrol from the rear tank to the vacuum tank on the dash, whence it is fed by gravity to the engine.

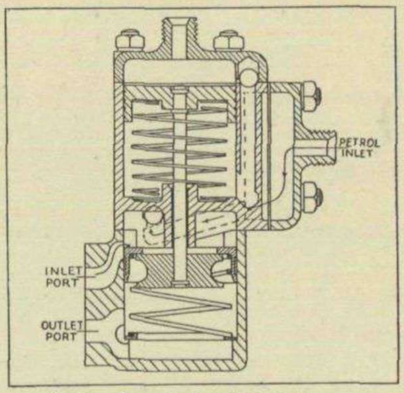
The maximum suction occurs when the throttle is nearly closed, while when driving all out and requiring the maximum supply of fuel, the suction is negligible. This results in fuel starvation unless the engine is frequently throttled down to get some fuel in the vacuum tank.

The majority of racing cars of a few years ago ensured their fuel supply at all times by means of pressure feed. In this method, of course, an airtight tank and filler cap are necessary, while the air pressure is usually supplied by a hand operated pump mounted on the dashboard and operated by the mechanic.

Such a system, while excellent for racing purposes, due to its reliability, is too crude for standard use on sports cars in the hands of the normal motorist, who has no wish to start manipulating pumps every time he starts off in his car.

This had led to the development of the mechanical or electrical fuel pump as a positive means of supplying the carburettor, and it has proved itself to be reliable and compact. What is more, it has shown itself equal to the strain of racing, and is now used on the majority of racing cars, either alone or in conjunction with a pressure system as a reserve.

If the two systems are used the airtight filler cap must be supplemented by a tap on the pressure line, which can be opened to the air, and so avoid the creation of a vacuum when running on the electric or mechanical feed.



Section through the S.U. fuel pump.

The electrical system seems to enjoy the greatest popularity at the present time, but there is a sign that other systems will also become common, the hydraulic pump operated by the lubrication of the engine being an example. This type is being developed by the S.U. company, whose carburettors are used on many racing and sports cars.

This fuel device consists of a small reciprocating plunger pump driven by a hydraulic reciprocating motor worked by the engine's oil supply. This, therefore, provides a positive safeguard against damage due to lubrication failure.

The pump is inserted in the system in such a way that the whole supply passes through on its way to the bearings. The motor piston consists of a sleeve with a large aperture in the middle. This is closed by a valve which is connected to the petrol piston by a piston rod passing through a guide which separates the two cylinders. Both the pistons are supported by coil springs, that under the petrol piston being the stronger. Oil enters above the oil piston and forces it down, carrying with it the valve and petrol piston.

During this stroke, petrol is transferred from below to above the petrol piston by way of a ball valve located at the side of the petrol cylinder. Near the bottom of the stroke the sleeve is arrested by a washer located near the bottom of the oil cylinder, and the valve is forced by the oil away from its seating in the sleeve.

The pressure on each side of the sleeve is now equalised, and its spring throws it upwards and the valve follows it together with the petrol piston, which now expels petrol from the top union and sucks a further supply through the side union, via the petrol filter and through the ball valve located below the petrol piston.

The upward movement of the petrol piston and oil valve is controlled by the demand for petrol, and when this reaches the top the valve closes and the cycle repeats itself.

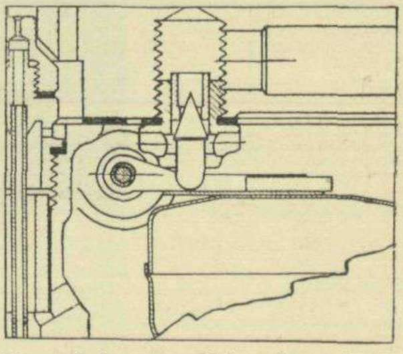
Although not in such general use as the electric pump, it has been thoroughly tried out, and was used on the S.V. Morris Minor which did an official speed of 101.96 m.p.h. at Brooklands last year.

The better known pump made by this company is the S.U. Petrolift, which is really a combined pump and gravity tank. The upper part of the instrument is a small tank, and the falling of the level in this automatically starts the pump and keeps it going till the level is restored. This ensures a constant gravity supply, and in a case where a dash tank is being removed and a rear tank fitted, no alteration will be required to the carburettor needle mechanism.

This instrument has been successfully tried out on racing cars and found perfectly reliable under hard conditions.

Incidentally, care is required when changing the fuel system to ensure that the carburettor is suited to the mode of supply. If the float system has been suitable for gravity feed, and a pressure system using a head of some 5 or 6ft. of petrol, flooding may occur due to the pressure of petrol on the needle being greater than that exerted by the float to close it.

This means that a modified needle or seating which gives a smaller area of needle exposed to the fuel, and consequently a smaller thrust on it, must be fitted. An example is the U-type Zenith in which the actual seating is easily removed

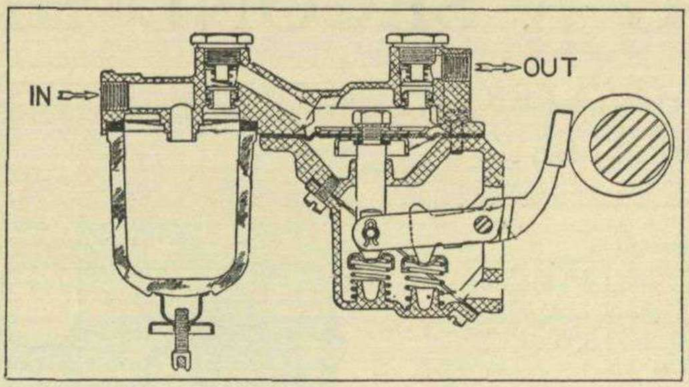


When a fuel pump is added to the petrol system the needle valve may require modification. In the "U" type Zenith the seating is detachable for this purpose.

MODERN FUEL FEED SYSTEMS—continued.

and a pressure type substituted. The pressure seating is merely of smaller diameter.

Another type of pump is that which is mechanically operated by the engine, of which the A.C. Sphinx product is an example. A plunger operating a diaphragm is driven from an eccentric, driven in turn from the engine. The fuel feed is automatically regulated to the supply required, and the pressure is controlled between fixed limits to avoid flooding. The pump is, however, of the full pressure type, and the carburettor must be arranged to suit.



The A.C. instrument which is cam-and-lever operated.

A mechanical fuel pump is also marketed by the well known accessory firm of Cooper-Stewarts. This is designed to be mounted on the crankcase and driven at half engine speed from the camshaft. The diaphragm actuating mechanism is extremely simple and the down-stroke of the operating lever is cushioned by a leather bumper, which makes for quiet operation and minimum wear.

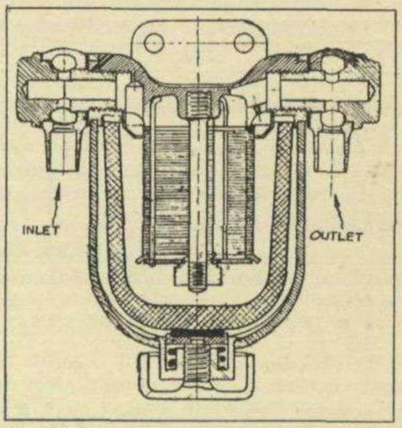
An electric pump made by Stewart-Warner. A sediment bowl is incorporated in the device.

The well-known Autopulse is another example of the electric fuel pump, and has been used with success on many makes. There is now a general tendency to abandon the old methods of fuel feed in favour of the neater and simpler systems now available.

The fuel pump is, of course, the main item in the system, and reliability can only be assured by attention to details. The filtering of the fuel on leaving the tank is of the greatest importance, and if your car is not already fitted with a good filter one should be obtained as soon as possible.

Filters are of various types, the wire gauze being the commonest, while chamois leather is also used. A very ingenious and effective type is the Zenith plate filter, in which a large number of slightly indented plates are pressed together, and the fuel filters through the fine gaps between them. Owing to its construction, there is a very large area of filter surface and therefore no chance of starvation, while water is separated from the petrol and falls to the bottom of the bowl. The provision of ample area is one of the most important points of filter design, as in a fast car there are times when a considerable flow of fuel is required, and in the case of a gauze filter of small size, a small amount of dirt on the mesh will seriously restrict the flow.

There are many amateurs who have to instal their own fuel systems, as when building up a hill-climb "special" of some sort, and the pipe line must be carefully arranged to avoid breakage. Long unsupported sections must be avoided, and as all chassis are subject to a certain amount of distortion it is a good thing to cut the pipe between chassis and engine, and insert a flexible connection. Special flexible petrol-proof tubing can be obtained, and is very useful for such work, but its cost is fairly high, and for piping on the chassis, would seem unnecessary. The copper pipe should be carefully annealed by heating to a dull red and quenching in cold water.



A sectional sketch of the Zenith fuel filter.

Special tanks are also required at times for such installations, and if they cannot be improvised from some existing tank, it is as well to get one made by some firm such as the Gallay Radiator Company, who specialise in such work.

Care and thought spent on the methods of transferring fuel from the tank to the carburettor are well repaid, and the present time is very suitable for looking over such details before next season.

BRITISH MATERIALS ONLY.

THANKS to recent research in the British glass and celluloid industries, safety glass for motor windscreens and windows will eventually be made entirely of British raw materials.

Hitherto, suitable sheet glass, and celluloid which is an essential component of safety glass, have not been available in this country. The glass is now to be manufactured in Lancashire; whilst a committee, headed by Dr. Hepworth of Imperial Chemical Industries, has for the last two years been investigating the possibility of manufacturing the right type of celluloid in this country.

This committee has carried out experiments in different parts of the country. Nitro cotton has been produced at Arder and Stevenston in Ayrshire. The celluloid itself has been made at Manningtree in Essex, and the completed product has been tested in the Triplex laboratories at King's Norton, Birmingham.

"Although we are quite satisfied with the quality of the foreign materials," said Mr. Graham Cunningham, Managing Director of the Triplex Company, "we wish, if we possibly can, to obtain our supplies at home—provided the quality is satisfactory.

"We are prepared to pay higher prices; but, as a matter of fact, British materials will probably cost no more than those produced abroad."

TRYING A SECOND-HANDER

VI.—A 1927 4-SEATER 3-LITRE BENTLEY

Brief Specification.

Engine: 4-*cylinders,* 80 *mm.* x 140 *mm. bore and stroke. Single overhead camshaft.*

Gears: 1*st,* 10.34 *to* 1; 2*nd,* 6.41 *to* 1; 3*rd,* 5.21 *to* 1; *top,* 3.92 *to* 1.

Wheelbase: 9*ft.* 9½*ins.*

Track: 4*ft.* 8*ins.*

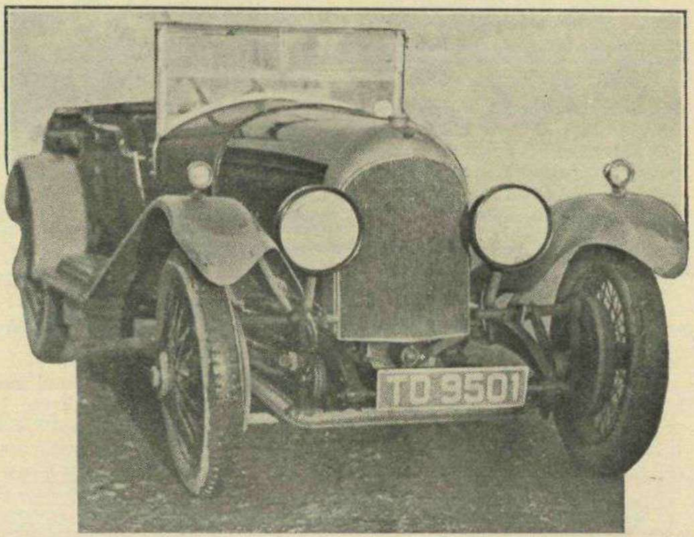
Chassis weight: 23 *cwt.*

Complete car: 26 *cwt.*

Tank capacity: 11 *gallons.*

Speeds on gears: 44 *m.p.h. on* 2*nd*; 60 *m.p.h. on* 3*rd*; 78 *m.p.h. on top.*

Braking distance from 40 *m.p.h.:* 46*ft.*



[*Motor Sport photograph*]

Both in outward appearance and performance the 1927 Bentley belies its age.

WHEN a firm starts to make motor cars, and with its first model springs into a position in the automobile world unattained by any of its rivals, there must be something more than usually remarkable about that model. Such was the case of the famous 3-litre Bentley which brought its name to the position of being a household word among motorists, and which has made history both on its own, and on behalf of the motor industry of this country.

Whatever may happen to the Bentley car under its new regime, whether new models are introduced or not, the name itself has gained such a position that nothing can ever alter it. The foundation of that name was the 3-litre 4-cylinder car which first regained for this country some of the laurels of international racing after we had ceased to take an active part in the Grand Prix races.

In considering this model as a second-hand car, there is a great difference between it and the normal used vehicle, as the very policy which governed its design and material, has had a far reaching effect on its value through the years. There are many people who try to impress on us the fact that motorcars when new, whatever their particular points, are only worth so much a pound, and their value in so many seasons is decided merely on a fixed scale of depreciation, and that after a certain number of years they automatically reach scrap value and are not worth further attention.

We are willing to admit that with the majority of mass-produced utility vehicles such is the case, but there will always be exceptions, especially in the field of sports cars. If a car is sufficiently well built in the first place, and possesses sufficient individuality of design and performance, its value will always be sufficient to make periodical overhauls and replacements well worth while, and this in turn will cause the value to be maintained much better than in the case with cars whose production is legion, and whose models are continually changing.

When, through H. M. Bentley and Partners of 3, Hanover Court, who specialise in Bentleys, we had a 4-seater sports 3-litre for a few days, we were able to realise once more the indefinable but none-the-less definite fascination, of a car which is built to an ideal of mechanical excellence, and not to the more sordid standards of low price and large sales.

Modern developments have undoubtedly given us cars of much higher performance for the same size, which in competition work entirely supercede the model we were trying, but this somehow does not detract from the pleasure of driving the Bentley, as its performance is in itself sufficiently good to satisfy almost anyone but the racing man, while the manner in which it achieves its performance is almost more important than the figures themselves.

The car seemed to show no signs whatever of being 4 years old. It looked the same as it must have done in its first season, and it ran like a car which has just passed through a period of careful running in. Its mechanical silence was remarkable and its oil consumption—always a barometer of wear and tear—quite negligible. On a cold morning it started at the first touch of the starter button, and its flexibility was amazing. This may not seem very important in a fast car, but it really is, and on long journeys a motor which will, when required, roll gently through a crowded town at 10 m.p.h. or less on top gear without fuss or snatch is very pleasant indeed.

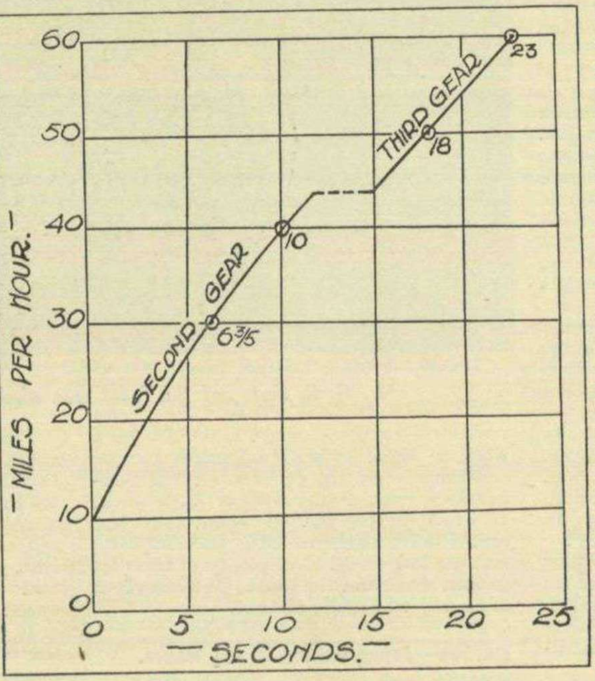
Once in open country again the very easily operated gear change calls for use if the full performance is to be enjoyed, and the acceleration by this means is definitely good, and has the advantage of being proportionately better at high speeds than at low, as the figures show.

The maximum speed on the level was 78 m.p.h. which requires a fairly long stretch of road to reach, but which is held without any fuss owing to the engine's ability to pull a high gear. This is extremely pleasant on a long run as it enhances the feeling that nothing is being overstressed, and means a higher average speed without

TRYING A SECOND-HANDER—continued.

fatigue. 70 m.p.h. can be maintained as a cruising speed, with plenty of throttle left, it being a peculiarity of high geared cars that a comfortable cruising speed is near their maximum. At 60 m.p.h. the engine is only doing some 2,500 r.p.m., which is another reason for the seemingly everlasting properties of this machine.

The steering is delightful, high-geared without being heavy, and with plenty of life in it. This enables the driver to "chuck the car about" under perfect control and with the minimum of hand movement, while he can always feel exactly what the front wheels are doing even on the greasiest surface, making skid corrections instant and almost automatic. The rear wheels did not at first seem to hold the road as well as the front, but suitable adjustment of the Hartfords all round effected great improvement in this respect. The road worthiness in general is of that high standard which only extensive experience of speed work can give, and makes one long to set off on long journeys for no other purpose than to enjoy driving the car.



The petrol consumption taken over a fast run of 161 miles, was 13½ miles per gallon of B.P. "Plus," which suited the motor perfectly. This figure is considerably lower than we have obtained on similar models, suggesting that the carburation was set too rich on this car.

The brakes of this model have always been famous, but it is very interesting to note that the actual braking figures obtained are equal, within very small limits, to the best obtained on any car built to-day, which shows how far ahead of their time they were when first introduced. They are direct operated without servo assistance, and it seems that this system, provided the car is not too heavy, gives the most positive and best graduated braking.

When it is realised that one of these cars can be bought, in first-class condition, for the price of a cheap, mass produced small car which it will outlast many times, it is small wonder that so many enthusiasts find them such an attractive proposition. Moreover, if given the reasonable care that such a car deserves, they will prove a thoroughly sound investment for many seasons to come.

A Veteran's Record.

THERE are motorists to-day who insist that the average life of a car should not be allowed to exceed three years at which age, they say, it should be consigned to the scrap-heap. Others magnanimously grant five years of activity, but there are few who consider that a car of ten years old is worth petrol and oil.

In actual fact there are hundreds of 15 or 20 year old cars still in existence, whilst the present popularity of "old crock" trials has drawn many even older models—forgotten and unused for years—from a restful obscurity.

An elementary school teacher in Central Europe, however, has just supplied information which probably establishes his car's claim to a record life of continuous service. He bought the car second-hand 19 years ago—almost a record for ownership!—and apparently even then did not know its make. He has now discovered a plate bearing the chassis number and the name of the makers—the Wolseley Motor Car Co., Ltd. Records show that the car was built in 1904, yet this Hungarian motorist writes that it is still being used and does long journeys without any trouble! On the three-year plan this veteran Wolseley has therefore enjoyed nine lives but, unlike the proverbial cat, is still going strong and ready for a tenth.

An Argentine Trial.

THE first reliability trial of the Asociation Automovilistica Argentina was held recently over a 341 Kilometre course, starting and finishing at Buenos Aires. An average speed of 40 km.p.h. had to be maintained, and secret checks were in operation at various points where the majority of the 38 competitors lost marks. Only 10 of the entrants completed the course with absolutely clean sheets, among whom was Mr. E. F. Greene, on a Humber "Snipe," while another "Snipe," driven by Mr. Cyril Atkinson, was unfortunately a few seconds out at the secret check, but completed the course to time and was penalised 5 marks. The trial was run on similar lines to the type with which we are familiar in England, and aroused great interest in Argentine motoring circles.

The Wanderers' Return.

TWO young men from Widnes who, a few months ago, set out on a motorcycle and sidecar in search of adventure in Africa, have now returned to England. Their trip included a remarkable ride across the "Dark Continent," during which they set up a record by travelling from Cairo to Capetown in three months and two days.

These young men, Farrell and Johnson, did not start with the object of making records or doing anything spectacular, but rather with a view to having a look at the world, and to getting away from industrial England. They certainly had their full share of adventure, and, to judge by the experiences they related at the Ariel works in Birmingham, they are to be congratulated on getting back safe and sound.

Their worst misfortune was an encounter with a fellow-countryman who overtook them when they were struggling through terrible country with a load of guns, trophies, souvenirs and spare clothing. This fellow adventurer, having a "safari" lorry, offered to take on their impedimenta, to relieve their Ariel of the burden. They gladly accepted the offer, but on reaching the agreed meeting place they instantly regretted their trustfulness, for the "Samaritan" did not turn up and they never saw him again. So the men from Widnes arrived in Bulawayo with nothing but their motorcycle and the clothes they were wearing!

However, if they lost their trophies then, they did not return to England empty-handed, for they brought with them the skins of many animals, including that of a leopard, and a great many reminders of their encounters with natives, such as tribal dolls and so forth. They were full of praise for their machine and their praise for it went deeper than enthusiasm, for on not a few occasions their lives depended upon its performance.

ITEMS OF INTEREST

FROM VARIOUS SOURCES

Safety of High Speed Motoring.

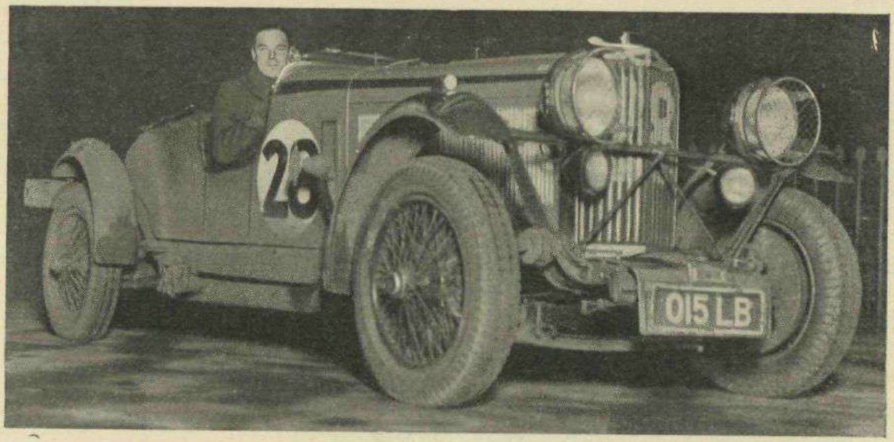
CONTROVERSY on the subject of high-speed motoring has been revived as a result of the publicity given to a run from Glasgow to London in which Mr. G. E. Scott with a "105" Talbot beat the Scots Express by 33 minutes.

In this case the car had a maximum of about 100 m.p.h. and averaged 53 m.p.h. in indifferent weather. Some people will say that such a performance must have been dangerous. It is not necessarily so, however, and amongst those who vouch for its safety is the London owner of a Rover "Meteor," who states that on the same trip, without taking risks, he has beaten the train by 55 minutes.

This motorist is prepared to "take on" the higher powered car responsible for the present controversy, provided that it is driven by an ordinary business man like himself (Mr. Scott is on the staff of Messrs. Clement-Talbot, Ltd.), and he believes that he can beat it to Glasgow. He stipulates safe driving, however, and as a check he suggests that each car shall carry a traffic policeman with power to disqualify his driver if risks are taken!

The scheme has the merit of novelty and the "speed cops" would doubtless add much to their store of knowledge. The possibilities, however, of their being allowed by the police authorities to undertake the trip seem rather remote.

Readers of MOTOR SPORT may recollect an account of a run to Scotland and back which was accomplished by a member of our staff in 1930. The car used on the occasion in question was a straight-eight Delage saloon, and the average speed from Radlett (Herts) to Gretna was 50 m.p.h.



Mr. G. E. Scott and the Talbot with which he did his high-speed run.

The Sunbeam Mabley.

SOME details have been sent us regarding the 1901 Sunbeam Mabley car, which was illustrated in last month's MOTOR SPORT. It was not exactly the first motor car produced by the Sunbeam Company; there had been an experimental type in 1899. But the Sunbeam Mabley car may be called the first commercial production.

It was 2¾ horse-power, priced at £130. The design was that of the 'S' sofa shape of the mid-Victorian period; the driver's seat was at the rear and two passengers could be accommodated in front.

It was awarded the Gold Medal, the highest honour obtainable, in the one hundred miles Liverpool Reliability Competition, including a hill climbing trial. Liverpool at that time took a leading part in encouraging the new system of mechanical transport, forming the Liverpool Self-Propelled Traffic Association, which was subsequently incorporated by the Royal Automobile Club.

In the early days of the motor car the Sunbeam Company made a special feature of their appeals to 'carriage folk,' pointing out to them the economy of the new system. This argument quoted from the first Sunbeam catalogue issued would hardly hold good to-day. It pointed out that a two-horse carriage would cost £2 15s. a week to keep, with £1 5s. wages for the coachman. On the other hand, the Sunbeam car would only cost £1 5s. a week, of which petrol and oil would take 10s. and a lad's wages to drive the car 15s.; and the lad would have plenty of time for garden work and the like! The chauffeur of to-day will smile at that.

Durban—Johannesburg in 10½ Hours.

THE Durban—Johannesburg light car record which is the constant object of attack by South African sporting drivers, has again been broken by a British car. Formerly it stood at 10 hours 42 minutes, but Mr. E. J. Bell in a two-seater Wolseley Hornet has just reduced it by 12 minutes.

Unlike many record attempts, Mr. Bell's was carried out with few preliminary arrangements and in a standard car. One day he and his wife drove from Johannesburg to Durban, and on arrival at the latter town realised that their running time amounted to less than 11 hours. Finding that the existing record stood at 10 hours 42 mins., they decided to attack it on their return trip. Their car was loaded up with holiday luggage, spare tins of petrol and oil, a large tent, camp chairs, blankets, etc., but despite these encumbrances they had no difficulty in reducing the time to 10½ hours.

The Roads of the Future.

ROADS will improve so rapidly in the next four years that cars will not be fast enough for them. This is a possibility—in fact a warning—advanced by Mr. Victor Riley.

Unlikely as it may seem at the moment, one has only to note the vast strides which have recently been made in road construction to realise that before the century is much older almost every main road will be as wide and straight as our present arterial high-ways. When that time comes, 90 per cent. of cars will be too slow for the roads, unless corresponding strides have been made in motorcar design.

Provided that roads are wide and straight, and have a rough, non-skid tarmac surface, speed is not dangerous in itself. Mr. Riley says: "Modern requirements call for speed, but speed without safety, comfort and economy is useless, just as in the future safety, comfort and economy will be useless without speed."

It would be easy, he says, to obtain the required speed of the future by using larger engines, but whether or no taxation is by horse-power, this must inevitably mean increased expense. No matter how fast our roads allow us to travel, the public will always require economy, and the small high-efficiency car is the obvious answer to the demand.

A Works School.

TECHNICAL courses which students are actually paid to attend are a prominent feature of the works organisation in the Pressed Steel Company's factory at Oxford, where steel bodywork and panels for Morris, Austin, Wolseley, Hillman, Rover and M.G. cars are manufactured.

Right in the middle of the works is a well-equipped lecture hall where classes are held not only in the evenings, but also during working hours. Students in the day classes may obtain time off on full pay, while standard wages are also paid those who attend classes after working hours.

With the help of the instruction given at this school, unskilled and semi-skilled workmen can train themselves for skilled jobs—and better pay—in the factory.

To encourage co-operation between specialized departments, there are courses in works management. The men are shown how their various jobs fit in with each other. The system of costing, for instance, is explained in detail so that individual operatives may understand the importance of saving time, labour and material.

Instructional films are shown three times a week and there are frequent lectures on safety.

Club News

THE BUGATTI OWNERS' CLUB.

THE night trial which the club held a few weeks ago was supported by some twenty-four members. The start was from Chorley Wood, Herts, and the finish on the following morning was at Amesbury, Wiltshire.

Conditions were none too favourable during the darkness as local fog was met with at several places on the route. Nevertheless, seventeen of the competitors finished, and of these six secured gold medals, three were awarded bronze medals and the remainder failed to gain awards.

The honorary secretary of the club is Mr. E. L. Giles, and his address is :—2, Queen Street, Mayfair, London, W.1.

INTER-VARSITY HILL-CLIMB RESULTS

850 c.c. Sports Class : 1, G. H. Goodson (Austin S.), 22.5 secs. ; 2, E. R. Collins (Austin), 25.3 secs. ; 3. W. G. Rushworth (Austin), 26 secs. 1,100 c.c. Touring Class : 1, A. C. Fairtlough (Austin), 30.2 secs. 1,100 c.c. Sports Class : 1, G. H. Goodson (Austin), 22.5 secs. ; 2, R. J. W. Appleton (Riley), 27.2 secs. ; 3, H. J. O. Ripley (Riley), 28.6 secs. 1,500 c.c. Sports Class : 1, G. R. Hartwell (Aston-Martin), 21.7 secs. ; 2, C. Tucker (Bugatti), 22.4 secs. ; 3, D. G. Hopkins (Frazer-Nash), 22.8 secs. Unlimited Touring : 1, A. S. Llewellyn (Hispano-Suiza), 26.7 secs. ; 2, S. Berlin (Humber), 29.6 secs.

Best car time of the day, C. E. P. Hole (Arrol-Aster S.), 20.7 secs. (This car was handicapped by 2 secs.)

The results of the 2,500 c.c. sports and unlimited sports were the same as the 1,500 c.c. sports.

THE SOUTHERN JOWITT LIGHT CAR CLUB.

The Southern Jowitt Light Car Club held its annual general meeting a short time ago at the Salisbury Hotel, Barnet, Herts.

In dealing with the progress of the club during the past year, the hon. secretary, Mr. E. A. Dudley Ward, who was in the chair, supported by Mrs. Ward, announced that there had been better attendances at some of the meetings than at any time during the eight years of the club's existence.

The accounts, which showed a very satisfactory state of affairs, were presented by the retiring treasurer, Mr. B. C. Ansley, whilst the prizes won during the season were distributed by Mrs. Dudley Ward. The Mitchell Cup for the best performance in the Night Trial went to J. W. Parsons, the runners up being G. J. Marksworth and B. C. Ansley. Officers for the 1932 season were elected as follow :—Hon. secretary, Mr. E. A. Dudley Ward ; treasurer, Mr. P. J. Sard ; committee, Messrs. G. L. Lawford and B. Watson (representing North London) and F G. Roots and P. J. Pilcher (representing South London).

LONDON EAGLE M.C.

There was an excellent entry for the recent Challenge Cup Competition, which was run over a difficult course, including the ascent of Alms Hill in the dark. All the cars failed on this notorious acclivity, but J. A. Berry (M.G. Midget) was runner-up to the motorcyclist who won the cup.

The Editor invites Club Secretaries to send details of their fixtures, sporting and social, for publication in these columns. These items should be sent to reach this office not later than the 16th of the month.

Jubilee Worm-Drive Clips

THE BEST POSSIBLE TO GET.

MAKE SURE YOU HAVE THEM FITTED ON YOUR RADIATOR JOINTS, LEATHER COVERS, ON UNIVERSAL JOINTS, AIR, OIL AND WATER HOSE JOINTS.

ALL IN ONE PIECE. NO PARTS TO LOSE.
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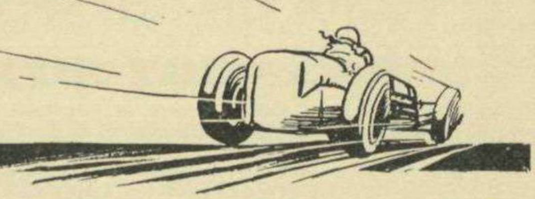
Rumblings

BOANERGES



THE hill-climb held at the end of November at Kimbolton Castle by the Cambridge University Club was rather spoilt by the very wet condition of the hill itself, and by the fact that the event had been altered at short notice from Aston Clinton, so that some entrants did not turn up.

Owing to the condition of the hill it was not possible to include the right hand-bend at the top, which might add considerable interest to the proceedings if used another time. Before this is done, however, it will need either some resurfacing or some very dry weather or preferably both. The results of this event appear under Club News.

Activity at Abingdon.

In spite of the general conditions at the moment being about as poor as anyone ever wants to see, there are still some bright spots in the gloom. I was down at Abingdon the other day, having a look round the M.G. works, and if there is any sign of a trade depression there I certainly could not find it. The whole place was buzzing with activity, and spite of the rows of chassis going through, and the number of cars being finished off and despatched, more and more orders are keeping them moving ever faster. MOTOR SPORT's prophesy at Olympia that the M.G. Magna would be one of *the* sports cars of the 1932 season, is being fulfilled already, for the majority of the cars I saw down there were this model, though there is still plenty of demand among more impecunious sportsmen for the famous Midget.

Trials Driving.

Watching the efforts of various drivers in the London-Gloucester, I was struck by the number of failures under circumstances where there was no real excuse for it at all. The standard of driving in this event was really very low, and seemed to have dropped considerably in comparison with what one used to find in such events.

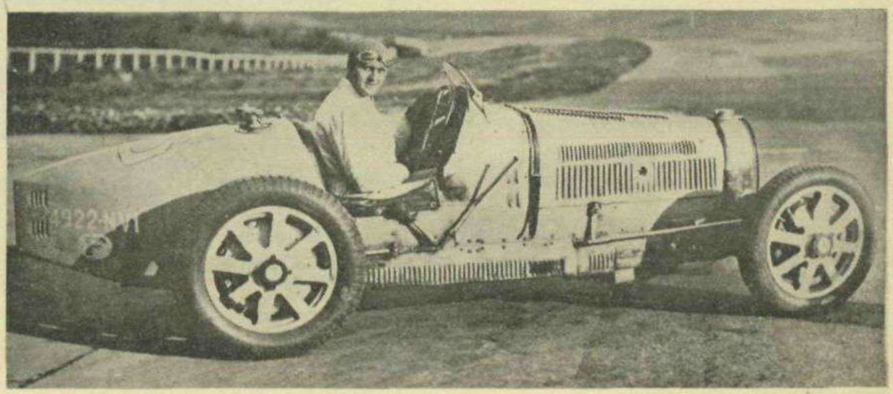
There is no getting away from the fact that trials driving requires a deal of trouble and practice if it is to be successful, and it was very obvious on this occasion that many entrants came badly unstuck through thinking that it was quite easy and that there was nothing for them to learn on the subject.

There were, of course, some cases where drivers did their best with none-too-suitable cars for the job, but what is enough to make anyone weep is the sight of perfectly suitable and very good cars being hopelessly mishandled by their proud owners. Some of the latter will persist in thinking that any modern motorcar as supplied, will go successfully through any trial without further attention, and with no knowledge on the driver's part of trials requirements.

The requirements and procedure are so elementary in essentials that one would imagine that everyone knows them, and that having learnt them will go out and practice on suitable trials hills until they acquire the skill to follow them out in practice.

In the motor car itself the chief requirements are light weight and power to pull a fairly high bottom gear at low speeds without stalling, combined with revs. enough to be able to rush a slippery hill. Add to this, generous sized tyres run at low pressure, ample steering lock, good ground clearance, and if possible, a solid rear axle. Given these and mechanical reliability, success in trials should then be merely a matter of practice and attention to detail.

There seems to be a great deal of misunderstanding about tyre pressures, and it does not seem to be sufficiently realised what tremendously increased grip is given by soft tyres. What is more, Dunlop wired tyres do not come off or burst when the pressure is let down, and in the case of a light car of say 15 cwt. or



Chiron as a film star. A photograph taken at Montlhery recently during the making of the film "Fantomas," in which the famous French driver takes part.

RUMBLINGS—continued.

under, with 27 x 4.40 tyres, it is perfectly safe to run at 12 lbs. per sq. in., unless the driver corners like a maniac! The only thing is that the tail is liable to swing to and fro slightly when travelling fairly fast, but if it means the difference between success and failure on hills, no one in his senses will mind a little of that.

To keep one's tyres at 30-35 lbs. in a trial with any slime about is merely asking for trouble, and ruining one's chances with an otherwise good vehicle in many cases.

In the actual driving of the car on hills, the golden rule is to go fast from the very start and get as much speed as possible on bottom gear before the worst of the hill is reached. It is simple then to ease off a trifle if bends demand it, while if wheelspin becomes excessive there is enough momentum to allow one to ease off the throttle and give the wheels a chance to grip afresh. The method which I saw practised by several drivers in the Gloucester was to approach a hill with continual cutting out, and then when they saw it was going to be sticky, down went the loud pedal too late, which merely produced violent wheelspin and failure.

Another trouble which was very evident in the re-start test on Bushcombe was the lack of power of many cars, which suggests that their owners, finding them quite satisfactory on the road, never troubled to make sure that the engine was clean and in good trim for the trial. In many cases a careful top overhaul with special attention to valve seatings would have made all the difference.

No very subtle tuning is required for such an event, in which fact should lie its appeal to the amateur, but good mechanical condition is essential. Very sensitive high compression engines in semi-racing tune are not suitable for trials work except in very expert hands, and the more normal sports type in really sound order and thoroughly run in is more suitable.

Among the minor but important details to be checked over is the fuel supply, and here an attempt on actual hills is the only sure way of trying it out. I have found cases of sports cars which function perfectly in normal use, but applied to a gradient of 1 in 4 or so, fail to get any fuel through to the engine owing to insufficient head of petrol. Some gravity feed tanks do not maintain sufficient head unless nearly full, while other systems sometimes have the pipes so arranged that air locks occur on steep gradients. All this sort of thing has got to be found out by experiment, preferably before the trial and not in it.

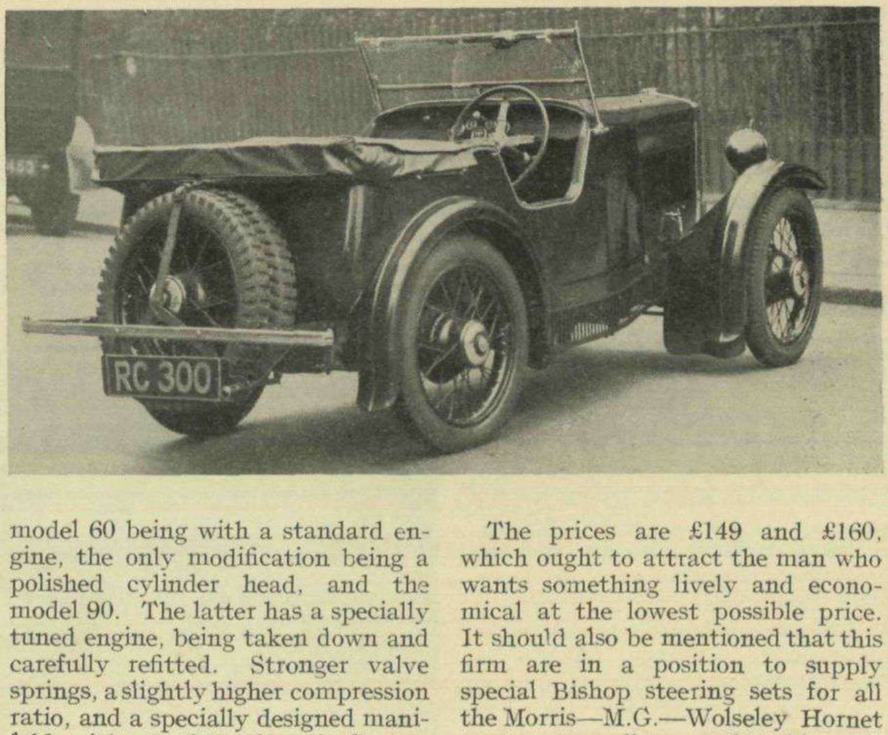
A SPORTS MORRIS MINOR.

ALL who have driven the standard side-valve Morris Minor must have been impressed with the life and smoothness of this little engine, and considered that it would make a good basis for a low priced sports car.

This has now been done in a very effective manner by M. A. McEvoy (London) Ltd., in conjunction with the well known body firm of Jensens, who have produced a large number of special sports bodies in the last season.

The car is a sports 4-seater of very attractive design and robust construction, giving ample room for luggage or occasional passengers in the rear without noticeable overhang, and without restricting the leg room in the front seats.

A close inspection of one of these cars revealed excellent attention to detail finish, while a short run showed that the roadholding was excellent and the driving position—with an extended steering column—very well thought out.



Two models are marketed, the model 60 being with a standard engine, the only modification being a polished cylinder head, and the model 90. The latter has a specially tuned engine, being taken down and carefully refitted. Stronger valve springs, a slightly higher compression ratio, and a specially designed manifold with an S.U. downdraft carburettor are other alterations.

The prices are £149 and £160, which ought to attract the man who wants something lively and economical at the lowest possible price. It should also be mentioned that this firm are in a position to supply special Bishop steering sets for all the Morris—M.G.—Wolseley Hornet range, as well as undertaking all classes of tuning.

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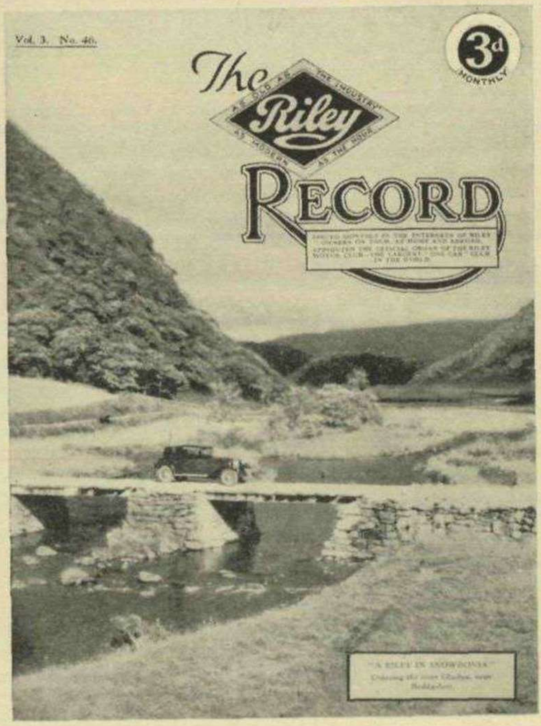

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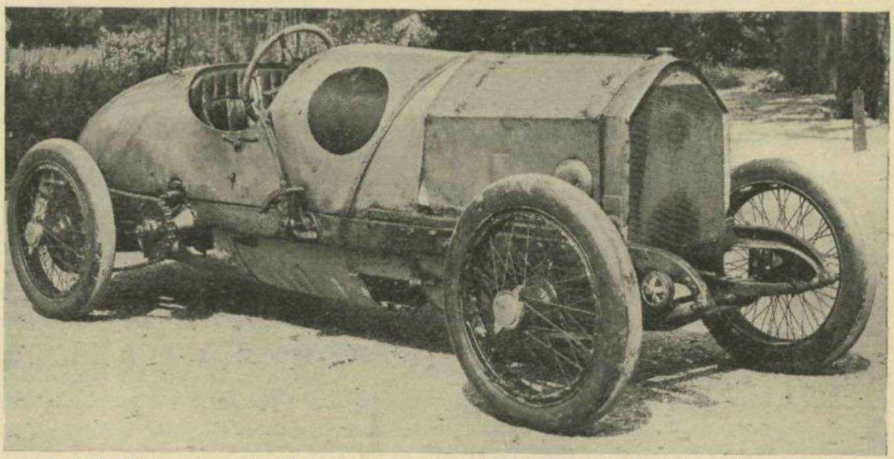
OUT OF THE PAST

DUELS ON THE DIEPPE CIRCUIT

ALTHOUGH now shorn of much of the fame and glory that it once held, the French Grand Prix still remains as one of the most important, purely for racing car events of the year.

Famous as it is with the memories and traditions of the greatest days of motoring, quite the most dramatic races in its history were those of 1908, when the Mercédès just got home, after using all their tyres, and 1912, which is remembered as the last appearance of the old type of road racers.

I was able to learn the story of these two stern struggles of pre-War times under rather interesting circumstances. In 1930 I discovered in a disused corner of one of the sheds at Brooklands the shrouded outlines of an apparently very large motor car, and on its covering or dust sheets being removed, was revealed one of the original chain-driven Fiat racers.



One of the Fiat racers referred to in this article. It was raced at Brooklands for about fifteen years, has a maximum speed of over 118 *m.p.h. and now, in the hands of its present owner, is in perfect order.*

I bought the remains then and there; and it was during the subsequent rebuilding of this monster that I was inspired to delve into the history of what is perhaps, one of the greatest racing marques that has ever been.

The firm first became known in the very early days of the sport, by winning the Florio Cup Race of 1904 at the rather amazing average speed of 72 miles an hour, for 231 miles, with one of the old 90 h.p. racers, then known as "Roaring Nineties," which had been built for the Gordon Bennett that year, and which, three years later reached the zenith of their fame, by winning all three of the international races held in Europe that summer.

The Battle of '08.

Which brings us to the Grand Prix de Dieppe of 1908.

For the first time in the history of the race, the cars were genuinely capable of over a 100 m.p.h. and a great battle was promised between the two teams of Fiat and Mercédès, both using engines of exactly the same size with the maximum bore allowed by the new regulations, of 155 mm., and a stroke of 160 mm., which gave a capacity of 12,081 c.c.

They were typical "speed monsters" of the period, with big 4-cylinder engines, high chassis and chain drive, and although tremendously fast they were very heavy for the small tyres that were used in those times, as was proved on the day of the race. For there was a hot sun blazing down on the road surface, already cut up by a fortnight's practice, and the pace set by these two teams was not sparing.

In their duel for the lead which lasted throughout the day, the big machines would come sliding up to the corners with the rear wheels partly locked, slither round, with the high chassis healing outwards, and go thundering away with wheels and chains spinning.

The three Fiats were driven by Nazzaro, Wagner and Lancia, and during the early stages of the race Wagner and Nazzaro ran into the lead, with the Mercédès team roaring close on their heels, despite frequent stops for changing tyres. Sometimes two of the white cars would be in at the same time with driver and mechanic grimed by dust and oil, working furiously on wheels that were, alas, undetachable, before they could tear off once more, down the long straight road to Auberville.

But none the less they were the fastest cars on the course, and just beyond half distance Wagner, driving one of the red racers, was hunted down, being forced to retire with a wrecked gear box.

Then just before the end, the race was snatched from Italian hands, when Nazzaro broke a crankshaft, and Lautenslacher, himself only just able to last out, having used the last spare tyre in the German tyre depot, came through and gained a hard fought victory with the Mercédès.

It was not until four years later that the Grand Prix was again held, as the French authorities were so disheartened at their many defeats that the old and once almost-unconquerable racing firms of France did not challenge the motoring world in an international event.

But in 1912 the classic race was once more revived in a great two-day event of 956 miles at Dieppe; ten laps of the circuit having to be covered on each of two consecutive days.

This time France pinned her hopes to an entirely new type of car. Gone were the usual ponderous machines with chain drive and a battery of ferocious looking outside exhaust pipes, and instead were the new Peugeot racers, using high speed long stroke engines, of the comparatively small capacity of 7 litres, built into a low shaft-driven chassis with Rudge Whitworth detachable wire wheels. They came as a definite challenge to the Fiat's who had remained true to their old traditions and working on the same principles of design which had proved so successful in the past, concentrated all their knowledge and experience of the old days into a team of the most monstrous racing cars. Incredibly high for road work they used 14,000 c.c. two hundred horse power engines with a stroke of 200 millimetres, which although they may have been old fashioned, held the road like iron: and in combination with two of the old S.61 racers as practice cars (one of which is still in existence) they made the strongest team on the course. But 956 miles is a long way, and whether or not they could last the distance remained to be seen.

At 3 o'clock on the morning of June 25th, 1912, the stage was set for the final battle between the new and old school of motor racing. The long, gaily-decorated tribunes rising tier upon tier above the supply pits were already filled by enthusiastic partisans of the French blue racers. Below, amid the sonorous beat of open exhausts, broken occasionally by a roar and leap of flame as a driver tried out his engine for the last time, the whole array of competitors were backing and filing into their starting positions in two lines on either side of the famous Dieppe road, which was to be churned up an hour later by the spinning wheels of 48 cars setting off on their long journey.

At the start it seemed that the race was only to last for a few hours, so fierce was the pace. Although starting at number 22, Boillot the French ace, handling Peugeot No. 2, ran through the entire field during the first 70 miles, and led the whole entry when he passed the tribunes for the third time, with Goux in No. 1 of the same team running close behind.

Their rivals however, the big Fiats driven by Bruce Brown and Wagner, although they started comparatively slowly, really began to get moving at this stage, and came by at great speed, with their chain transmissions whining, hard on the heels of the leading Peugeots.

Bruce Brown, on Fiat 2, came up with Boillot on the winding section of the course from Ew, and after some inspiring

DUELS ON THE DIEPPE CIRCUIT—continued.

work, left the Frenchman behind down the Dieppe straight, thus starting the duel which lasted between these two champions throughout the first, and during half the second day.

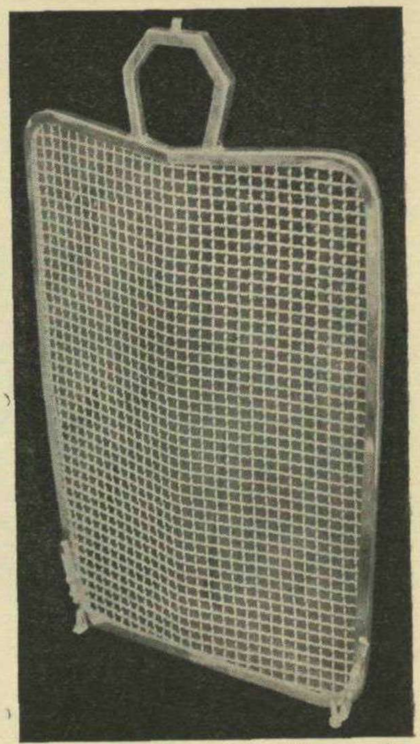
Now leading the whole race by position as well as time, Bruce Brown was handling his huge car superbly, taking the corners in long slides with the rear wheels locked, coming out of each skid at the right moment by switching in the engine with the throttle fully opened, which although resulting in terrific acceleration wore the tyres very quickly.

He was not to be slowed by this handicap however, and was the first to be flagged off at the end of the first day's racing; just before, a downpour of rain swept over the course, which would, no doubt, have helped the lighter French cars to gain somewhat on their heavier rivals had it come sooner.

Next day the roads were heavy with mud and very treacherous, a bad outlook for the big cars. But Bruce Brown was the first away from the pits and during the first four laps twice gained and lost the lead in a race of seconds against Boillot's Peugeot, which finally overtook him when three quarters of the race had been done, never again to lose the leading position, until just before the end, when one of those exciting scenes occurred, which characterise a really first-class race.

With only one more lap to go, Boillot alarmed his assistants by pulling in for more water and a new wheel; while this was being changed Wagner, having completed a glorious lap on the last big Fiat left in the running, went crashing by without making the stop, which was expected of him, and left Boillot to tear off in pursuit a few seconds later, with 37 miles in which he must hold the Fiat or lose the few precious minutes which he had in hand. Wagner thus finished his final lap at the head of the whole race, then a swiftly growing rumour arose that Boillot was held up with trouble somewhere on the Dieppe Straight. The minutes began to run out and then a car could be heard roaring out of Dieppe; for a few moments it was unrecognisable, until the well-known French blue flashed into view, and Boillot swept past the tribunes to win one of the most strenuous Grand Prix races that has ever been run.

The stoneguard illustrated herewith is marketed by the Motor Car Components Co., of 43, Lonsdale Road, Kilburn, London, N.W. 6. Of sturdy construction and excellent chromium finish, it is obtainable for M.G. Midgets at £2 15s.



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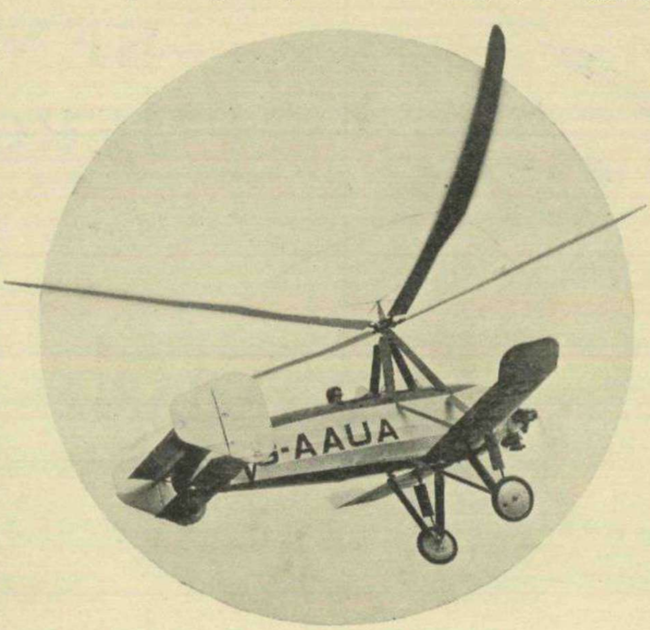
THE AUTOGIRO ADVANCES.

TWO NEW PRODUCTION MACHINES WITH MECHANICAL ROTOR STARTER AND FOLDING BLADES.

It is eleven years since Senor Don Juan de la Cierva designed and built the first Autogiro, and in the intervening period, in spite of many set-backs—of which popular prejudice against the unconventional was not the least serious—this remarkable aeroplane has slowly but surely advanced in development until to-day it has reached so practical and satisfactory form, in the opinion of its manufacturers, that they have decided to place it on the market.

The Autogiro is undoubtedly one of the most outstanding breakaways from the orthodox in the history of aeronautics, and even though it has been widely demonstrated both in England and abroad (probably more than any other individual aircraft) its extraordinary appearance and performance arouses very great interest wherever it is seen. And small wonder, for it is unlike anything else which ever went into the air.

When Cierva designed his first machine he did so with the main object in view of producing an aeroplane which would not stall under any circumstances, and prolonged thought and study brought him to the conclusion that in reaching this end the aeroplane as is now known must be ruled out. It is true that the modern 'plane of normal design is safe in the sense that it is reliable and has none of the "tricks" which characterised machines of by-gone days; an accumulation of experience and data now permits the designer to build a machine which is devoid of any structural weakness and which has a respectable performance in regard to climb, speed and manoeuvrability. Engines, too, are wonderfully reliable. But the conventional type of aeroplane can still be a dangerous vehicle in the hands of the unskilled and the unwary since it becomes uncontrollable below a comparatively high speed. The novice who cannot sense that he is aproaching the period of the stall, or a worried pilot intent on getting down in a sudden emergency, even in these days, can find to his alarm that the controls have "gone sloppy," and a wing has dropped, or worse still, he has gone into a spin. Provided he has sufficient height and knows how to act, this losing of flying speed need not end in disaster. But accidents still happen, and a big proportion of aeroplane crashes are due to the stall and unrecovered spin.

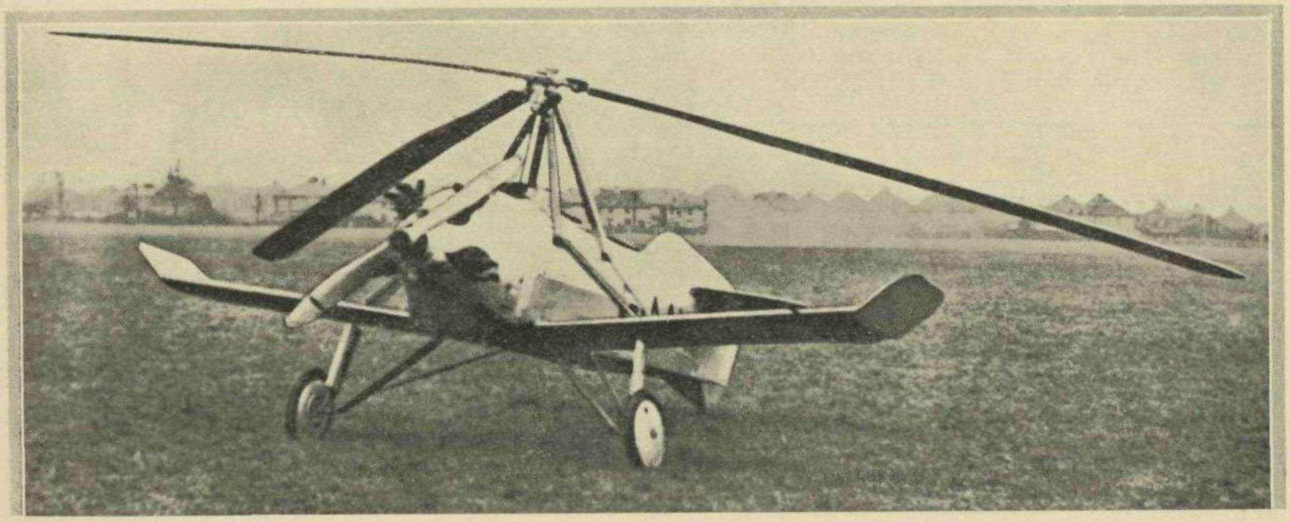


The Genet-engined C.19 Autogiro in flight. It was with this machine that so many demonstrations were carried out last year.

With the Autogiro no amount of mishandling can get the pilot into such difficulties, since by its design and working principle the necessity of maintaining a relatively high forward speed in order to keep stability is eliminated. How this is brought about can be best explained as follows :—

The blades of the rotor, which are mounted so as to revolve freely on the pylon, are in effect aerofoils of small chord; they are hinged at their attachment to enable them to have freedom in both the vertical or "flapping" plane, and in the rotational plane. Once energised they maintain their rotation by aero-dynamic action, and in revolving, induce lift to the machine. It will be readily grasped that the rotation of the blades is not dependent on the forward movement of the aircraft, and that even when the air speed is nil, other forces are acting upon them to keep them revolving, and thus, so long as they are moving, the rotor disc acts as the lifting medium. In other words, although the ma-

THE AUTOGIRO ADVANCES—continued.



The production model C.19 (Mark IV) which has been cleaned up very considerably. The rotor is now three-bladed, and is started by a drive connected to the engine. The blades, by a simple arrangement, can be folded back to facilitate the housing of the machine.

chine itself may have no forward speed, its wings are still travelling through the air at a high velocity, and thus giving support.

In the matter of stability, the hinged arrangement of the rotor blades to the shaft allow any difference of lift to be taken up by the movement of the blade in an upward or downward direction on the hinged root, so that all lift forces must pass through one point at the centre, and so supply complete stability.

It was in 1920 that Don Cierva completed the construction of his first experimental craft. This, as in the present Autogiros, had a normal fuselage, but the lifting surface comprised two four bladed windmills, mounted in a vertical axis and revolving in opposite directions. A normal type rudder, fin and elevator were used. Machine No. 1 proved a disappointment, and although various modifications were carried out, it was a failure.

Undeterred, the designer produced a second craft, and this had a rotor consisting of a single windmill made up of three cantilever blades, and a device was included in the general arrangement which allowed the pilot to alter the angle of incidence, so as to vary the amount of lift to the right or to the left. Preliminary trials afforded some degree of encouragement, but in the end Cierva came to the conclusion that his theories in regard to this machine were at fault, and although it was reconstructed and altered nine times, he finally scrapped it.

In the third Autogiro, the design embodied a windmill with five blades rigidly braced to the axis with steel wires, and although this machine was promising as far as lift was concerned, stability was lacking, and after being crashed several times, it was abandoned, and a fourth type was built.

The Articulated Blade Solution.

It was at this stage that Cierva tried out the principle of articulated blades in the rotor, which was subsequently to prove the solution of the problem. In his fourth design the rotor had four blades hinged at the roots, so that they were enabled to move freely up and down in the vertical plane, and in addition, a device was used so that the rotor column could be tilted to the right and the left by a control worked by the pilot. The idea of this was to maintain lateral control, but in practice it proved too difficult to operate. Incidentally, this machine (No. 4) was crashed no less than fifteen times!

An Intensive Two Years.

In all, the designing, building and trying out of these experimental models took about two years, and although a certain amount of success had been achieved, the Autogiro was far from being a practical or safe aircraft.

In January, 1923, however, Don Cierva constructed yet another 'plane which ultimately flew in a closed circuit for four minutes at Cuatro Vientos aerodrome, near Madrid, under official observation, and so the first definite stage had been reached in the evolution of his original aircraft.

Thus encouraged, he continued experimenting, and later met with such success that the Spanish Government authorities came forward with assistance, and under their auspices yet another machine was made. This particular Autogiro was built up on an Avro 504 fuselage, and the standard undercarriage, engine (110 h.p. Le Rhone) and tail unit were retained. It was flown quite extensively, and was demonstrated for the first time outside Spain, when in 1925 its designer brought it to the R.A.E. at Farnborough, and also flew it before French aeronautical experts at the aerodrome at Villacoublay.

Later it was shown and flown at the R.A.F. Display by Frank Courtney, who subsequently carried out a lot of test work for the Cierva Autogiro Company which was formed in this country in 1926. From that time until now, the company has worked incessantly towards the perfection of the Autogiro and something like twenty-one different types have been constructed and tried out. At the same time, demonstrations have been constantly made all over the British Isles and on the Continent, while in the U.S.A. the Pitcairn Autogiro Company of America Inc., have been doing work of a like nature.

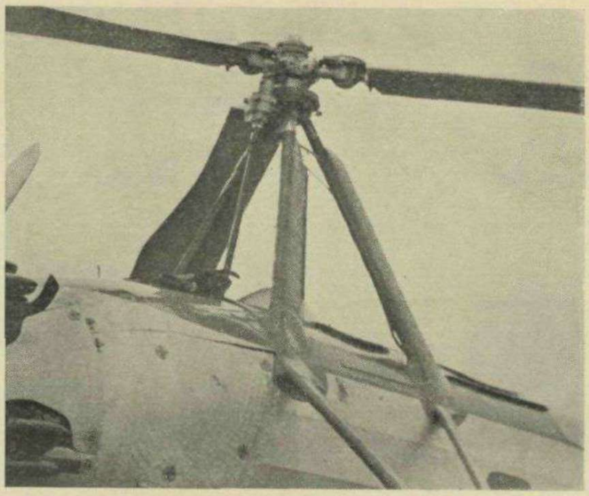
1932 Models.

And now, after 11 years of effort, the Autogiro has been placed in regular production in direct competition with light aircraft of the conventional type. There are two models, the C.24 and the C.19 Mark IV, and each is now standardized. The former is the latest design, and is a cabin machine with a three bladed rotor. Designed by the Cierva Company, the C.24 was made by the de Havilland Co.

This latest Autogiro has many interesting and striking features, of which the most startling is the rotor. In the earlier editions, the blades (of which there were four) were connected by lengths of stranded cable which served to prevent any tendency of any one blade to close up or " catch up " with the preceding one while rotating; in the C.24 rotor, this device is dispensed with and in its place stops are interposed between the roots of the blades at the hinges. The blades can also be folded back, to facilitate housing the machine. Another modification is found in the absence of the supporting cords which were used formerly to prevent excessive droop of the blades when at rest. The latter are now full cantilever, and as a result the rotor as a whole is much cleaner and neater in form and outline. A further development, which is a marked advance on previous practice, is that the rotor is now set in motion by mechanical means; readers who have followed the progress of Don Cierva's machine, may remember that in the early models the rotor was started by using a rope wound round the shaft, and this was pulled by about half-a-dozen

THE AUTOGIRO ADVANCES—continued.

men—a somewhat crude device. Then experiments were tried with rockets attached to the tips of the blades. Later it was found that the initial rotations could be set up by taxiing the machine about for some minutes. But this, of course, was a slow and rather elementary business. The next step was to incorporate a novel form of tail unit in the Autogiro's general lay-out in which the elevator could be raised to a vertical position so that it deflected the slipstream from the propellor on to the rotor, and set it in motion in that way. But now the engine is utilised to do the job, through a straightforward system of shafts, gears and a clutch.



In this photograph, the new method of attaching the blades to the rotor hub can be seen, while the starting-gear shaft is also discernible.

The cabin Autogiro has a metal fuselage of more or less normal design, and this is constructed with welded steel tubes with the rotor pylon built into it. In order to keep down the frontal area the cross-section is narrow and the enclosed cockpit contains two seats in tandem. The upper part of the rotor pylon is faired off in good streamline form which tapers down to terminate in a fin of large area at the rear end. The tail unit is of normal type, except that two fixed fins are attached to the ends of the tailplane. The rudder and elevator are of orthodox pattern, and are operated by the usual rudder-bar and stick. The main 'plane with upturned tips and narrow chord which has been a common feature of all the more recent types of Autogiro is retained in the C.24, and faired struts are affixed to the spars and to the main members at the top of the cabin. An ordinary form of "axleless" undercarriage with a small "booted" wheel in front, and a well-cowled D.H. "Gipsy" Mark III engine complete the new model's specification.

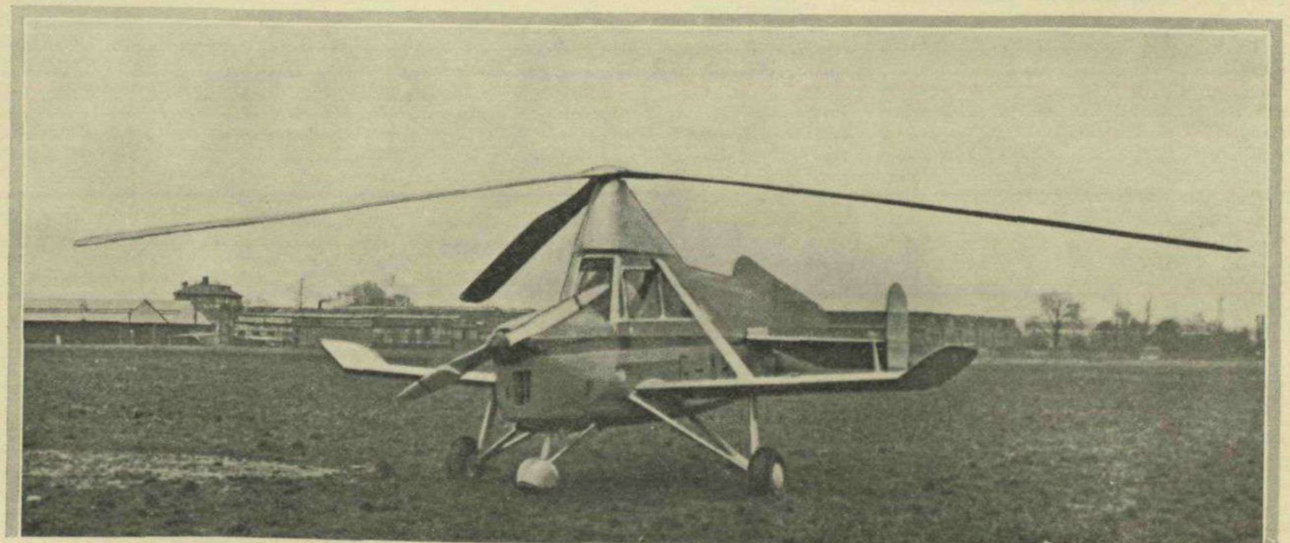
Actual test of the C.24 shows that it has a maximum speed while flying level of 120 m.p.h., and that it can be flown without loss of height at 28 m.p.h. It can be landed, too, without any difficulty at no more than 7 to 8 m.p.h. The incorporation of the mechanical starting now makes the initial rotation of the rotor a matter of about 30-40 seconds, and the actual take-off occupies no more time than is found with machines of normal design and with approximately the same horse-power.

The other production model Autogiro—the C.19, Mark IV—is an open two-seater similar in general arrangement to the type which has been flown so extensively by Mr. R. A. C. Brie in the past twelve months. It is fitted with a 100 h.p. Genet Major engine, and like the C.24, has the new mechanical starting gear for the rotor. Various details have been cleaned up, and the craft, while still appearing unusual, looks compact, sturdy and workmanlike. The performance figures of the C.19 are given by the makers as follow :—

Maximum speed, 105 m.p.h.; minimum speed (without loss of height), 28 m.p.h.; cruising speed, 90 m.p.h.; take-off run, 30 yards; ceiling, 14,000 feet; range (at 90 m.p.h.), 250 miles. It has been abundantly shown by expert pilots, such as Mr. Rawson and Mr. Brie, that the Autogiro does all that its designer claims for it; that it takes off as quickly and flies as quickly as the average, ordinary aircraft of the same power. It has also been proved that it can be landed in such places and in a way that would be impossible with other aeroplanes. And now that the "windmill" 'plane is available for the private purchaser it should be possible to gauge soon how far its unique quality of foolproofness will go in overcoming the inevitable prejudice which the unconventional has to combat before being accepted as a practical proposition.

Humber's 25 Aeroplanes per Week.

VISITORS to the Humber factory at Coventry are generally very curious to know why a model aeroplane is suspended prominently in the entrance hall. Few people realise that several years before the war a Humber monoplane was actually produced and was one of the first machines ever to fly. The model at the factory, however, is an example of Humber's war-time production, when no fewer than twenty-five complete aeroplanes were turned out every week in addition to a vast quantity of other war material.



[*Motor Sport Photographs.*

The cabin Autogiro bristles with novel features. Note the large central fin, the faired rotor pylon and the "booted" wheel. The engine is an inverted D.H. "Gipsy."

MAKING THE BRITISH SALMSON

PEOPLE who are not conversant with aircraft manufacture and all that it entails sometimes express surprise at the high cost of machines. They point to an aeroplane, which they may describe as " a lot of wood, a lot of fabric, sundry metal bits and an engine," and then turn to the popular, comprehensively-equipped car, and demand to know why there is so much divergence in the respective prices.

That the former probably represents a month's total output of a factory while the latter is produced on a colossal scale may be accepted as a partial explanation, but one needs to go further into the subject before the inquirer becomes satisfied that the modern light aeroplane is something more than a winged packing case, priced at an exorbitant figure.

No one can deny that the modern cheap car is astonishingly well-made and reliable, but the workmanship and material put into it cannot possibly compare with that found in aircraft production.

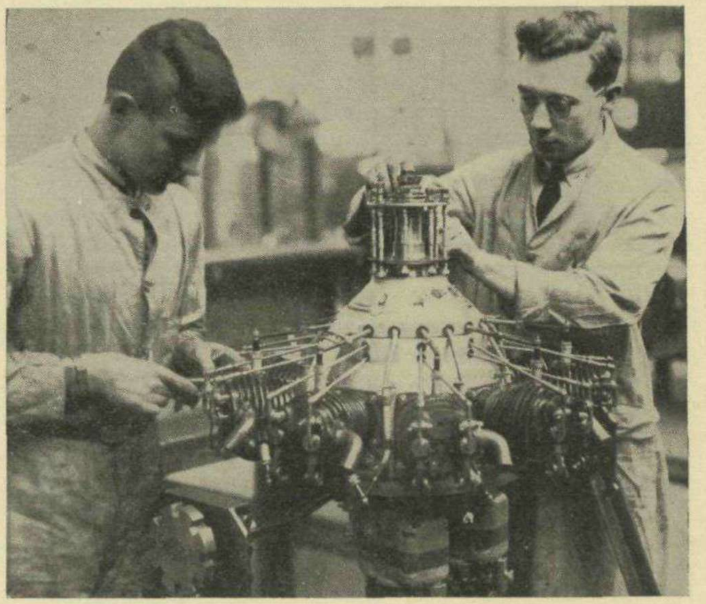
Quality of raw material, care in its selection, and extreme accuracy in manufacture are the basic rules in British aircraft building; only by adherence to these can reliability and safety be obtained, and no better way could be found of showing the uninitiated to what pains the manufacturer goes in securing these vital qualities than a visit to a works; the British Salmson works, for instance.

Of French origin, Salmson engines were first made many years ago, and a characteristic is that they have always been of the radial type. In modern times, the most famous unit turned out by this concern is the A.D.9—the little 40-50 h.p. nine-cylindered engine which is fitted to the Klemm monoplane, the Monospar experimental machine, Hinkler's " Ibis," and a number of French light 'planes. This engine is now being built in this country by the British Salmson Aero Engines, Ltd., at their very modern factory at New Malden, Surrey, on the Merton by-pass road.

The English version of the A.D.9, besides being British-built throughout, has sundry modifications embodied in its design, such as dual ignition, and from start to finish its manufacture is unusually interesting.

The cylinders emerge from the " rough stores " in the form of forgings, to go through a series of operations which result in their reaching a stage when they are machined all over with cooling fins, and valve openings in the domed head in the finished state.

During the whole of the machining of all parts, compressed air is used to dispel the swarf in order that the very fine limits with which the operations are carried through may not be varied in the slightest degree. Thereafter, the cylinders pass to another section of the works when the induction and exhaust passages and rocker-arm posts are welded on to the heads. The passages are made of sheet steel, and therefore have perfectly smooth internal surfaces.



Putting the finishing touches to an A.D.9., prior to its bench test.

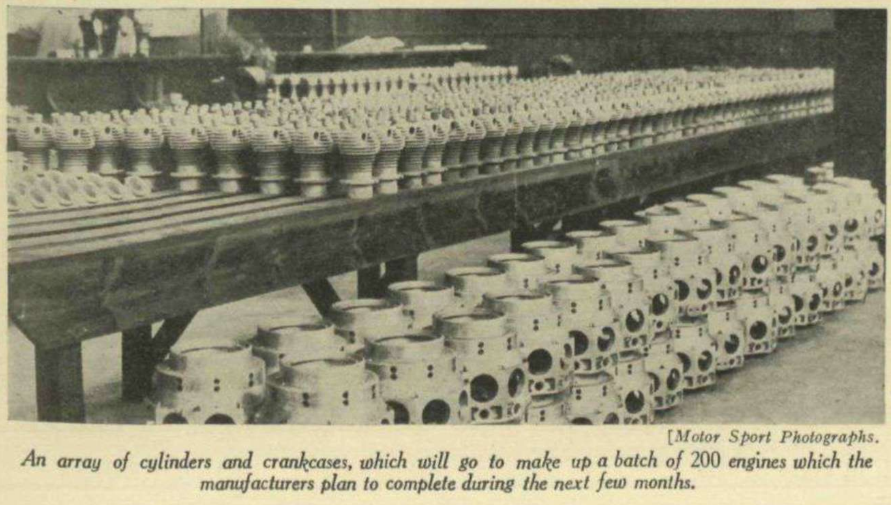
The next step is the tinning of the head, prior to casting the aluminium fins on it. This is an interesting and intricate operation; the cylinder is placed in a mould, after being heated up to a prescribed temperature and the aluminium is poured in. The mould used is made of a special sand compound, and is so hard, after being baked, that it will even withstand being dropped on a concrete floor.

The crankshaft (which has a single-throw), like the cylinders, is received at the works as a rough forging, and each one has a " test piece " cut from it which is checked and examined in the works inspection department. The shaft when completed is hollow, and has an oilway drilled diagonally through the rear web.

The connecting rod assembly consists of one master rod and eight auxiliaries; the latter are attached to the solid big end of the master rod by the usual wrist pins. The valve gear of the A.D.9 comprises a cam ring which carries ten cams in two rows; it is driven at 1/10ths engine speed through a train of epicyclic gears. The cutting of the internally toothed rings in this assembly is a wonderful piece of work, and the meshing is so fine that there is no semblance of back lash whatsoever.

In the crankcase one finds a further example of the high standard of workmanship which characterises the whole of the British Salmson. Formed in two sections, it is made from an aluminium alloy, with internal and external webs for stiffening purposes. In order to obtain perfect oil-tight joints the cylinders are first of all lapped onto their respective flanges, before the holding-down studs are put in place. The front half of the crankcase carries the valve gear and to the rear half are attached the oil pumps, magnetos and induction ring. The oil pumps which, like all the other parts of the A.D.9, are made in the New Malden works, are of the gear type, and they are driven from the tail shaft of the engine. The pump assembly undergoes a separate test before being attached to the power unit.

If the visitor to the Salmson works is impressed with what he sees in the manu-



[*Motor Sport Photographs.*

An array of cylinders and crankcases, which will go to make up a batch of 200 engines which the manufacturers plan to complete during the next few months.

MAKING THE BRITISH SALMSON—continued.

facture of the A.D.9, he will undoubtedly be further so on learning of the Air Ministry "type tests" which the engine had to pass before acceptance. Attached to the works in a test shop, and here the engine was installed on a dyanamometer to undergo its trials, the intensely searching nature of which is revealed in the following list :—

After a preliminary power curve run—Two periods of 10 hours each on 9/10ths full throttle with a final run of 5 minutes at full throttle.

Two periods with calibrated air screw at 2,100 r.p.m. (the A.D.9's maximum r.p.m. is 2,200) of 10 hours duration each.

Two periods—one of 9 hours at full throttle and 1,955 r.p.m.—the other, of 1 hour at full throttle and 2,100 r.p.m.

A slow-running test of 10 minutes at 460 r.p.m., an acceleration test. and a high speed test at 2,430 r.p.m. for 1 hour.

The unit which was submitted for these tests behaved perfectly throughout and required no adjustments or replacements of any sort ; which entitles the British Salmson to take its place in the circle of really good aero motors.

SLIPSTREAMS

Hinkler's Homecoming.

OF the welcome and congratulations which have been given in recent years to pilots on their arrival in this country after some outstanding flying achievement, I am sure that few has been so whole-heartedly genuine and sincere than those which greeted Bert Hinkler last month. There is no getting away from the fact that aviation has been used, and is still being used, by the publicity-mongers, the "me-toos" and people of that ilk solely as a means of self-advertisement, and the ill-informed daily press has been only too ready to help them in getting into the limelight ; so much so that one has become utterly nauseated by the nonsensical reports of "mystery flights," "gallant air girl's dash" and so forth. This aviation hysteria, which affects the press, infuriates an old War-time pilot friend of mine. On a recent occasion, having seen a newspaper photograph of a young pupil of a flying school, he read aloud the caption which was to the effect that although "only 17," the young man depicted had qualified for his pilot's certificate.

"My flight-commander was just 19 when he was killed, after 600 hours flying over the line, and the average age of the fellows in my squadron was eighteen," was his only comment. Which, after all, accounts for his snorts of derision.

However, if he feels contemptuous about the stunt press attitude towards aviation, he certainly joined everyone else in his admiration for Bert Hinkler's great flight home from America. Bert flies because it is his job, and therefore, even if he attempted to boost himself it would be excusable since it would probably help him in his profession. But he is essentially and genuinely modest, and it is difficult to get him to talk about any of his achievements.

Bert, of course, was flying in the service during 1914-1918, and afterwards he joined A. V. Roe, Ltd., as test pilot. I got an insight into his doggedness and thoroughness at Lympne in 1926 at the time of the light aeroplane competitions. Hinkler was flying the first "Avian" that was built, and he had set his heart on winning the premier award. But early in the competition he had trouble with a leaking petrol tank. Removing it for repairs was a not-too-easy job but he got it out, had it repaired and continued the next day. Further trouble developed, however, and the tank was again removed, repaired and re-installed. And the whole time it was being done, Hinkler was there supervising, joining in with the mechanics and lending a hand, in spite of the fact that he'd had a long and tiring day of flying in cold, windy weather. Even when the tank trouble was cured, he suffered further misfortune with a loose airscrew hub, and when he was finally put out of the trial with engine trouble, we all felt very sorry for him.

Like most men of small stature, Bert Hinkler has tremendous powers of endurance ; which is a most valuable asset for a pilot who makes a habit of long-distance flights, and he has been doing them at odd periods since 1919 !

Amongst his best efforts, apart from his renowned Australian flight of 1928, was his non-stop trip from London to Turin, and from Sydney to Bundaberg in the little Avro "Baby," which was powered with a 35 h.p. water-cooled Green engine. Then later with the same "Avian" which he had flown in the Lympne trials of 1926, he did a remarkable flight from Croydon to Riga. This latest achievement, in bringing his "Puss Moth" across the Southern Atlantic single-handed in 22 hours, through storms and unfavourable conditions, is his greatest triumph, however.

Bert is undoubtedly "our great little man."

A Brooklands Incident.

Although it is a favourite theme of writers of "thrillers" and crook film scenarios, the aeroplane snatcher has, as far as I am aware, never appeared in real life until recently. A few weeks ago, the staff of the Brooklands School of Flying adjourned for lunch at the usual hour, leaving their machines, as is customary, in front of the sheds. Returning to the bleakness of the aerodrome, one hour later, Captain Davis was mystified to find that he was one perfectly good aeroplane short. Where was it ? No one knew. A search by air was made at once, but neither on the ground nor in the air was the missing machine to be found. The hours passed, and then a 'phone call came through—Would the B.S.F. be so good as to send out to Tidworth some petrol, as their machine was there, having run out of juice ? And the culprit ? An Army trooper, erstwhile ground engineer of the B.S.F. Two years previously this man had worked at Brooklands, and had, during his brief period of employment with the B.S.F., received about 5 hours' of instruction. But he had never flown solo until the time when he acted upon this sudden urge to aviate, and which fortunately for everyone concerned ended up with a satisfactory forced landing at Tidworth. A most extraordinary affair.

"RUDDERBAR."

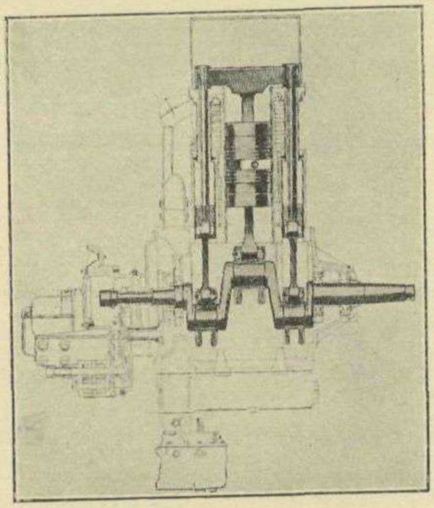
A NOVEL AMERICAN AERO ENGINE

OPPOSED PISTONS IN NEW RADIAL UNIT

THE opposed-piston design has been used from time to time in the past in automobile engines, but so far the principle has not been applied to aero power units.

An American firm, Dawn Motors, Ltd., of Los Angeles, however, have recently constructed and tested an engine embodying this idea, and the results have been sufficiently encouraging to induce them to make a second type on the same lines.

In the Dawn engine, there is no cylinder head in the ordinary sense of the term, its place being taken by the outer piston in the cylinder barrel. This outer piston is coupled to the crankshaft by rods and cranks, and the two pistons move in opposite directions. The object of the arrangement of this design is to reduce any tendency to roughness in running, a point which is of considerable importance in aircraft engines, especially with machines of metal construction. Economy in fuel is another feature. Theoretically, in an engine of normal design, a certain amount of energy on the firing stroke is lost in the thrust against the main bearings, and in the effort to "blow off the cylinder head." In the Dawn engine, the energy of the expanding gases is applied to the pistons which both transmit their effort to, and turn the crankshaft. Another feature of this motor is that there is no necessity to counterbalance the crankshaft, since the two pistons induce a pull and push action on the crankshaft at the same time, thus giving a balanced inertia of all motion.



Sectional view of the Dawn engine.

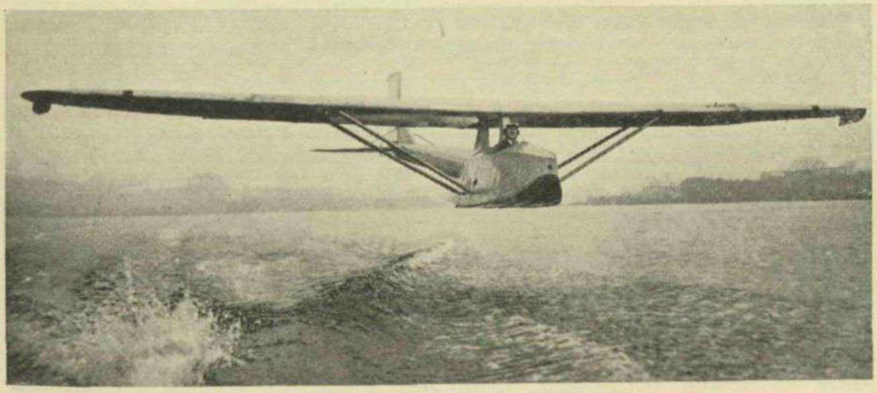
Yet another point about the Dawn engine is that there is an appreciable reduction of risk of fire in the air since there are no flaming gases from the exhaust ports, as the exploded mixture burns itself out on the power stroke with the valves closed.

The first experimental unit is a five-cylinder air-cooled radial with bore and stroke dimensions of 105 mm. and 95 mm. At 1,300 r.p.m. it produces 90 h.p., and 110 h.p. is given off at 1,450 r.p.m. It was given a test which covered a period of 700 hours, and according to the manufacturers, no trouble was met with except certain oil leaks from the crankcase due to blow-holes in the casting.

The Dawn concern are now engaged in the construction of a seven-cylinder 300 h.p. engine embodying the same principles as are found in their first type.

B.A.C. INNOVATIONS

LAST month Mr. Lowe-Wylde carried out a series of demonstration flights with his B.A.C. boat-glider on the Welsh Harp at Hendon. This craft, as can be seen from the accompanying photograph is of the high-wing monoplane type, strut-braced and with wing-tip floats. The fuselage is of unusual construction, being built up in tubular form of laminated plywood. The machine is a two-seater and has dual control. Mr. Lowe-Wylde informs us that he will carry out a tour later on this year with his craft, in conjunction with an aviation project which will be headed by Sir Alan Cobham.



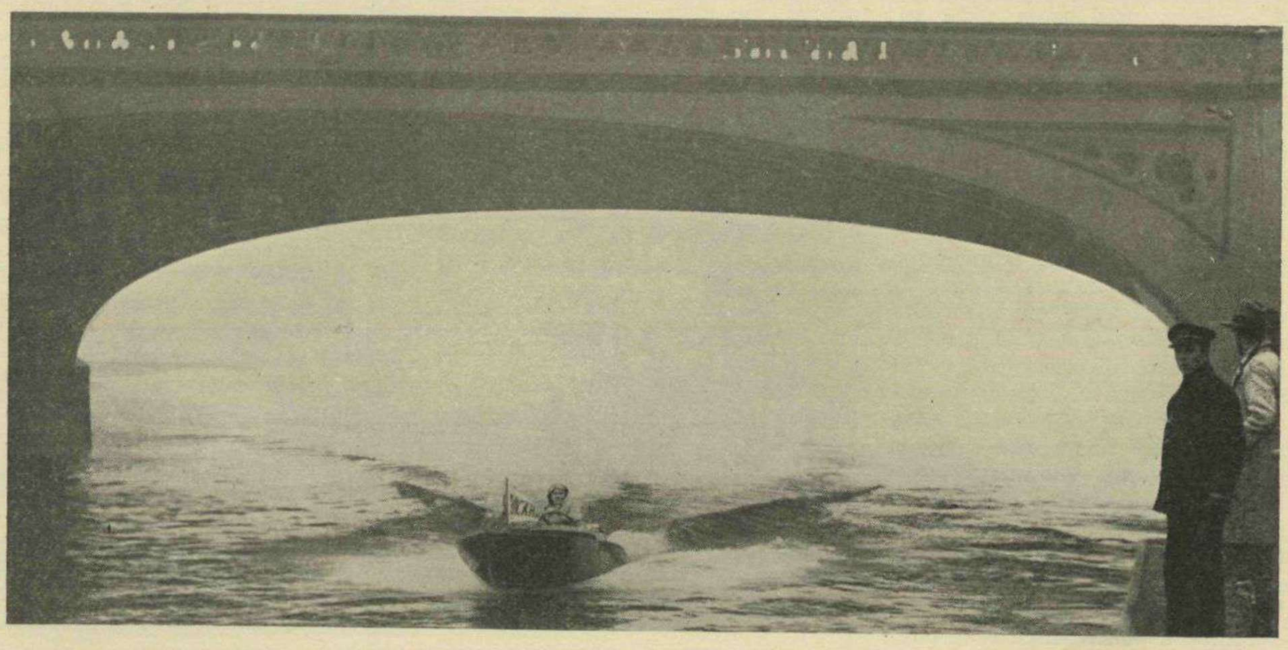
The B.A.C. boat-glider about to alight on the Welsh Harp, Hendon. The pilot is Mr. Lowe-Wylde.

The B.A.C. boat-glider is the only machine of its type in Europe.

The B.A.C. concern, of which Mr. Lowe-Wylde is principal, has introduced a further innovation just lately. They are now marketing an extremely clean and compact glider (known as the B.A.C. IX) and it is being built in such form that it may be bought in parts and assembled by the purchaser. The span of the B.A.C. IX is 35 feet, the length 18 feet 6 inches and the wing area 150 square feet. The main plane is not in one piece, but two, and each half is attached to the centre-section struts by three bolts. The rudder and elevators are interchangeable and there is no fixed tailplane. In order to obviate over-sensitivity in the elevator, the control is arranged differentially, which allows of a large travel of the joy-stick in the central position with only a few degrees movement on the elevators, while at each end of the joy-stick range the movement of the latter is speeded up. The ailerons run the whole length of each wing and are operated by a push-and-pull rod from the sides of the fuselage.

The complete set of parts for the B.A.C. IX is obtainable, at the present time, for approximately £35 10s.

LONDON–AMSTERDAM by OUTBOARD



Cole's Sharland-engined See dinghy leaving Westminster Bridge.

MR. R. T. COLE'S REMARKABLE CROSS-CHANNEL TRIP.

MR. R. C. COLE has made several trips to the Continent by outboard motor-boat, each one more ambitious than the previous. On his latest trip to Amsterdam he was accompanied by Miss Lander-Thomson, an Australian, who has had quite a deal of experience on sea-going cruisers. Together these two put up a very plucky show in the face of adverse weather and luck. The journey was planned from the point of view of British propaganda abroad, and nothing about their outfit or equipment came from a foreign marque. Cole told me before he started from London, that he hopes to make during the coming year, similar trips to as many of the European capitals as may be practically reached by water.

The boat used has a reputation behind it for speed, for it is the well-known See National Class dinghy which has been so successful during the past season and, it is therefore of much interest to note that this hull proved one of the dryest in Mr. Cole's experience, riding out some of the heaviest seas that he has met with. The length of the boat is 14ft. with a 4ft. 6in. beam, while the bottom has a novel clincker construction in which the planks are lapped over in the reverse way to normal practice. Apparently, in this direction no loss of strength is experienced for in spite of a very severe buffeting with a load far above normal the hull remained perfectly tight. The only alterations to the boat itself, were the fitting of a back seat to the front thwart and an extension to the foredeck to provide extra dry stowage for luggage, etc. A 13 gallon auxiliary fuel tank was fitted amidships, from which petrol was pumped direct to the Sharland motor. I have always been interested in this engine and as Cole is the only man who has in recent months made any outboard endurance tests I have had to wait till now to hear about this motor as a sea-going proposition. Its performance has more than justified my hopes.

As a precaution, one of the 125 c.c. two-stroke Sharlands was carried under the fore deck, and purely owing to bad luck this little job was necessary to reach Amsterdam.

A start was made from Westminster Bridge at 11 a.m. on Tuesday, the 8th of December. The run down the Thames should have been quite pleasant had it not been for a slight drizzle, for the day was quite calm. The engine was kept at ¾ throttle right down to the North Foreland and here Cole had got so far ahead of schedule that he proposed a stop to check up on all the nuts and bolts, as the engine was new, and to clear away some sludge in the float chamber of carburettor, the presence of which was indicated by a reluctance to accept full throttle. Everything was found to be tight, and after checking up on the oil level, she was started up and run on into Ramsgate at nearly full throttle, and in spite of the stop of approximately half-an-hour, they were tied up and snug by 4 p.m. This average of 18 m.p.h. for the 90 odd miles to Ramsgate is believed to be the fastest time for any motor boat over this course. A pity they had that stop.

Of course, anyone who goes to sea in a small open boat at this time of year must be an enthusiast, and Miss Thomson and Mr. Cole demonstrated their enthusiasm by making a dawn start on Wednesday. This is not quite so bad as it sounds, however, for Cole informs me that I should note for reference purposes that dawn is about 7 a.m. A quick run in clear weather and sublime optimism was made to Dover which was reached at 7.50 a.m. by their chronometer—a Schneider watch in which sole reliance was placed, and what is more, justified. At Dover the boat was refuelled, incidentally with a petrol well in keeping with an all-British trip—Regent. Customs took about three-quarters of an hour after which a course due S.W. was steered out of the harbour. Outside, the clear of the early morning had given place to a very misty atmosphere, and the sea was much rougher, necessitating a watchful eye on the compass and it was through this concentration that the captain ran the boat at a most awkward angle clean into the wake of a liner going down-Channel. A huge green wave crashed down on the boat and engine, and about half-a-ton of water remained aboard. The motor, refusing to run on sea water in place of air, had naturally stopped and for the moment the position was critical. However, Miss Thomson clambered out on the fore deck to keep a level trim while Mr. Cole went aft to bail, a process which took about half-an-hour. Rubber outboarding suits by Anderson looked after their physical comfort while their mental wasso sorely

Read what Richard Cole says of the

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LONDON—AMSTERDAM BY OUTBOARD—continued.

stressed, so it was not quite as bad as it might have been. Distress signals were waved with a Duckham's oil flag, and a Belgian cargo boat stood by, and after, wonder of wonders, the motor had started for the first time of asking, saw them safely back in Dover.

They put into the Camber at Dover, and here with the aid of the crew of a cable laying ship for which Cole was most thankful, the motor was taken down for inspection; as there was not a drop of water inside, which is a new one in my experience of outboard motors, it was assembled, and trials were carried out with the lading of the boat to get a better trim. As a result, the boat was only overloaded to the extent of 17 gallons of petrol. The weather was far too bad the following day to attempt a crossing, and these conditions lasted up to Friday evening when the wind dropped.

At five to twelve they put out (ladies should particularly note this) in the wake of a cargo boat, and for three quarters of the way played touch-and-go with this vessel's log line, after which, Mr. Cole states, they went ahead and steered a fancy course of their own into Calais.

A near Shave.

At the far end of the harbour entrance they ran their boat into a mass of floating seaweed which brought them to a sudden stop. Cole was clearing the weed from the prop when he suddenly saw the bulk of the cargo boat loom up in the Channel mouth. Cole got a decided move on with his work, and Miss Thomson flashed their torches straight at the bridge of the incoming boat, which, however, failed to see them at all. Further, she started to turn in the opening basin, and the stern of the boat driving round increased the danger a hundredfold for it put them in direct line with the threshing propeller which was showing clear as the cargo boat was unladen. By this time they were shouting frantically, and it was only when the propeller of the vessel was a few yards away that they were noticed, and the engines stopped. Even so, nothing could have prevented the boat from swinging on and crashing them very badly had not the Sharland started up first yank of the cord. When the outboard fired the screw of the cargo boat was no more than five feet away. Feeling that a rest was indicated after the excitement, and that it was about 2 a.m., they mutually agreed to dispense with customs formalities for the night, and to achieve this object without being awakened in an hour or two by an outraged official, the little craft was hidden in the lock at the entrance to the canals. Owing to the time lost at Dover, another dawn start was proposed, seconded and executed.

An exceedingly choppy run was made to Dunkirk, where captain and crew put in to eat a hearty breakfast.

The journey to Ostend was most unpleasant, and the heavy sea running reduced them to a quarter-throttle, while at Ostend with a choppy sea right across the harbour mouth, 20 minutes was taken to get into the inner basin.

Owing to the state of the tide it was necessary to wait three hours, until four o'clock, for the lock gates to be opened into the canals. They could do no more than just get into the canals, and then close down for the night. This delay of half-a-day resulted in another burst of virtue for a dawn start was made on Sunday, 13th. Mr. Cole stated that "we reached Bruges so quickly that we had a job to stop," but from what I understand the pangs of hunger exercised a greater force than that of enertia. Following breakfast, they had their second narrow escape. While awaiting to enter a lock, and wishful of securing a good position, they cruised between two huge barges that were coming out. They had just about crossed the path of the second barge when an inch steel hawser pinged out of the water a foot behind the tank of the motor and tautened six feet above their heads!

A stop was made at Ghent for lunch, and there the ship canal was followed to Terneuzen. On the way, the Dutch customs were passed with the following delightful little ceremony. A man on the bank shouted "Oo Ay", whereupon the boat was pulled into the bank. "You Engleesh"? was the next question, to which an affirmative was given. "You have booze on board, yes?" and here a regretful negative had to be given. The only other thing that seemed to bother them was whether the motor ran on petrol or benzole, and on being told the former, Mr. Cole apparently went up in their estimation for he was permitted to pass. The last part of the journey was completed after dark.

A start was made as usual the following morning, but even so they missed the opening of the sea-lock into the West Sheldt and consequently had to waste half a day. The morning was spent in swabbing decks and being entertained by the captain of an English collier who seemed surprized at the dimensions of Mr. Cole's boat, and even after producing field glasses and scanning the basin, declared he could not see it.

The Sharland disabled.

After half-an-hour's run out of Terneuzen in the direction of Williamsdyke, they had the misfortune to hit something of an exceedingly solid nature just below the surface of the water. The impact was sufficient to put the twin motor completely out of commission. They had been watched out of Terneuzen, and a boat put out soon after they stopped. When this motor-boat arrived, however, they had the other engine fixed on the transome. The night was spent at Williamsdyke.

Early starts were essential if Amsterdam was to be reached before the freeze-up of the smaller canals, to avoid getting lost in the mass of intricate islands. A barge was followed to Dordrecht where a night was spent.

From Dordrecht they followed the canals to Gouda, where a lunch stop was made. The proposed termination for the day's journey was to have been Alphan, but things came to a complete stop at Boscote. Here there is a narrow channel connecting two main canals and as someone had left a sluice open back at Gouda, the water was coming through this channel like a mill race. About 30 barges were below, and each in turn would have a shot at riding up the rapids. They would get half-way, only to be overcome by the current, and sweep back out of control. After seeing one of the barge's dinghies smashed to pulp, Cole put discretion as the better part of valour and put up for the night. Next morning an uneventful and monotonous journey was made to Amsterdam, which was reached at 3 p.m.

At Amsterdam their headquarters was the De Hoop Rowing Club, and they were well looked after by Mr. C. A. Redfern, of the British Association. Cole states that for the last 250 miles, the small engine was going at full throttle for at least 12 hours a day, a fine performance.

EQUIPMENT USED IN THE TRIP.

Moseley float-on-air cushions and Schneider watch, Duckham's oil, Regent petrol, Anderson's rubber outboarding suits, Speedoil upper cylinder lubricant, Pyrene and Ever-Ready torches. —F.M.

MISS ENGLAND III.

As stated before in these pages Lord Wakefield of Hythe is not taking his setback in the last B.I. Trophy races at Detroit as anything but an incentive to further effort. It has now been definitely decided that there shall be a Miss England III and that the present record holder should be retired. Lord Wakefield delayed his final decision until his designer, Mr. Fred Cooper, A.M.I.N.A., was able to state that it was possible to incorporate in the new craft a greater degree of safety than in the predecessor, though she was a remarkably stable craft, and at the same time to aim for a speed of 135-140 m.p.h. At the present moment things have progressed just beyond the costings stage and it is stated that the price of a shot at the record and the Harmsworth Trophy is very near to £50,000.

Miss England III is to be powered with two of the successful Rolls Royce R. type engines (of Schneider fame) which will put the brake horse power figure of the power plant at something above 5,000. Miss England II was powered at 3,800 and achieved the record speed of 110 m.p.h. As the American, Gar Wood is now stated by his native press to have equalled the figure of 110 m.p.h. in Miss America IX, recently re-engined by Liberty's, it may be necessary for Kaye Don, Lord Wakefield's pilot, to have to go record breaking seriously in the near future. That the opportunity is given to this country to defend this record is due solely to Lord Wakefield, and I am certain that all those with a glimmering of pride in their country's prestige will accord him most hearty thanks. Thornycrofts, who have the contract, state that Miss England III will be completed about next March, so that she should be in time for the International Meeting on Lake Garda.—F.

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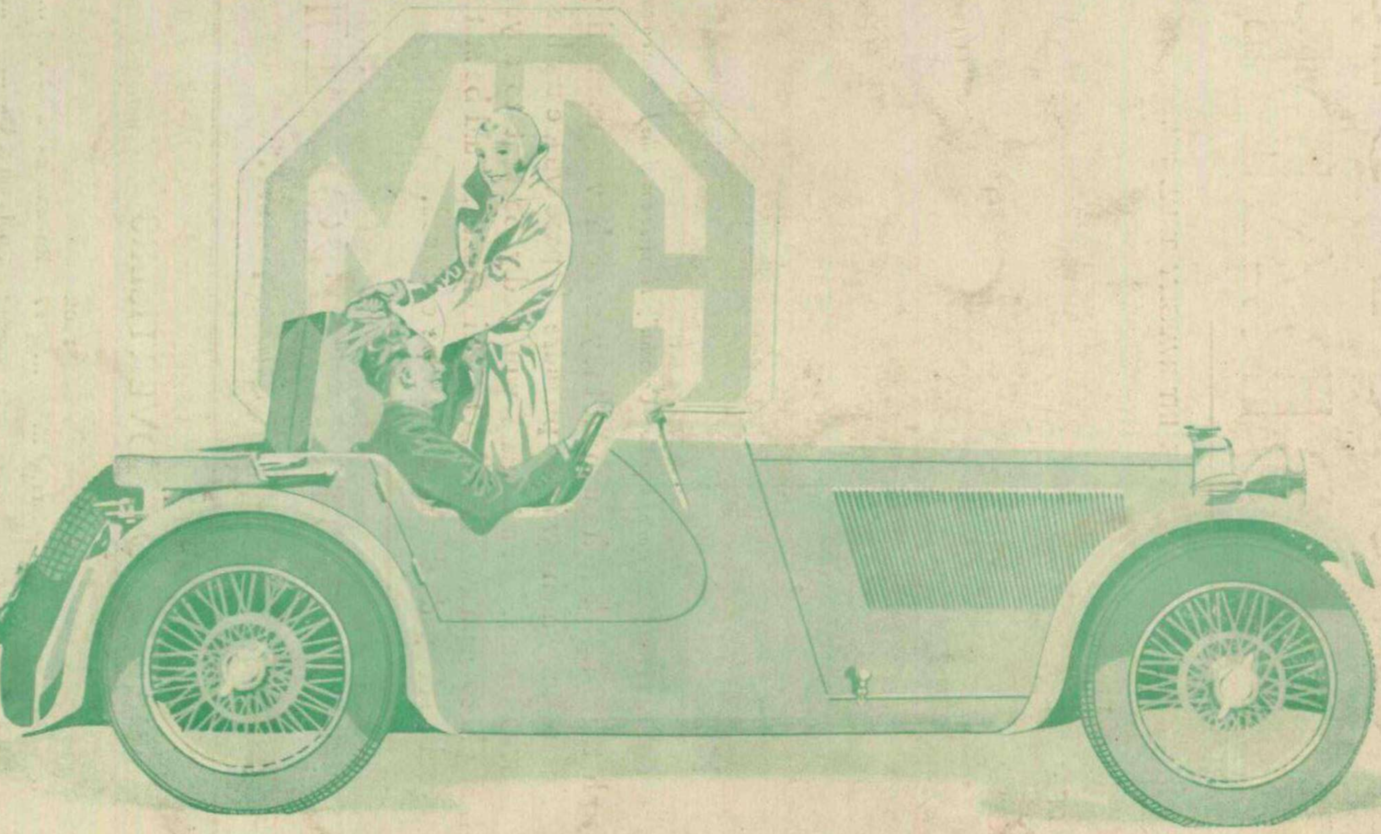

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